TANKS IN THE BATTLE OF THE BULGE

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NEW VANGUARD 281

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TANKS IN THE BATTLE OF THE BULGE

The Battle of the Bulge was the largest confrontation between German and American tanks during the campaign in the European Theater of Operations (ETO) in 1944–45. This book surveys the principal tank types on both sides, as well as tank surrogates such as the tank destroyer/Panzerjäger, and the assault gun/Sturmgeschütz. Due to space limitations, it does not cover self-propelled artillery or light armored vehicles such as armored cars and half-tracks. For convenience's sake, the term "AFV" (Armored Fighting Vehicle) in this book refers to the tank surrogates such as assault guns and tank destroyers.

The combat records of the Panzer Divisions and US armored divisions were inextricably linked to the many battles and skirmishes of the Ardennes campaign. This book aims to provide a primer on issues specific to the use of tanks in the Ardennes. This includes a survey of the types of tanks and AFVs used in the campaign, as well as details about their organizational deployment. This book also provides the first comprehensive survey of the number of tanks and AFVs deployed during the campaign, as well as details of their combat losses.

THE CAMPAIGN

A Panzer IV lg.(V) tank destroyer from the SS-Panzerjäger-Abteilung 1 of Kampfgruppe Hansen, 1.SS-Panzer-Division, near the Poteau crossroads on December 18, 1944.

With Germany on a fatal spiral to military defeat, Hitler conceived a massive counter-offensive through the Ardennes to regain the strategic initiative in the West. The final operational plan, codenamed *Herbstnebel* (*Autumn Mist*), envisioned a thrust out of the Eifel region to the Meuse river, followed by a dash for the port of Antwerp. The aim was to divide the US and British armies and force a "New Dunkirk." Senior German commanders such as the OB West leader Generalfeldmarschall Gerd von Rundstedt and Heeresgruppe B leader Walter Model were skeptical of the chances for success. The basic premise of *Autumn Mist* was that the Panzer force must cross the Meuse river a few days after the start of the offensive, before the US Army could reorient its forces for a counter-attack. Due to the need for speed, *Autumn Mist* contained the vast majority of the Panzer force in the West.

Autumn Mist was conducted by Heeresgruppe B and involved three field armies in the initial stage,

with the possible commitment of a fourth a few days later. The *Schwerpunkt* (focal point) of the offensive was on its northern shoulder, with the 6.Panzer-Armee led by SS Oberstgruppenführer Josef "Sepp" Dietrich. Its spearhead was the I.SS-Panzer-Korps, including 1.SS-Panzer-Division and 12.SS-Panzer-Division. Once this corps reached the Meuse river, the II.SS-Panzer-Korps would be injected to propel the offensive to its main objective of Antwerp.

In the center was the 5.Panzer-Armee, led by General der Panzertruppen Hasso von Manteuffel. This formation included the 47.Panzer-Korps and 56.Panzer-Korps. Its mission was to push over the Meuse and shield the left flank of 6.Panzer-Armee. In the south was the 7.Armee of General der Panzertruppen Erich Brandenberger. This was by far the weakest of the three German formations, primarily an infantry force with very modest armored support. This force was intended to establish a defensive anchor on the southern flank in the mountainous area along the Belgian–Luxembourg border.

Panzer-Brigade.150 was issued Panther Ausf. G tanks with sheet metal additions to make them resemble the US Army's M10 tank destroyer. This is ersatz M10, tactical number B-7, commanded by Oberfeldwebel Backmann of Pz. Komp. Dreier, Kampfgruppe Z. This tank was knocked out by a bazooka during the fighting for Malmédy.

Wehrmacht Panzerwaffe in the Ardennes, December 16, 1944	
6.Panzer-Armee	**Oberstgruppenführer Josef "Sepp" Dietrich**
I.SS-Panzer-Korps	**Gruppenführer Hermann Priess**
1.SS-Panzer-Division "Leibstandarte Adolf Hitler"	Oberführer Wilhelm Mohnke
12.SS-Panzer-Division "Hitlerjugend"	Standartenführer Hugo Kraas
Panzer-Brigade.150 "Rabenhügel"	Obersturmbannführer Otto Skorzeny
II.SS-Panzer-Korps	**Obergruppenführer Willi Bittrich**
2.SS-Panzer-Division "Das Reich"	Brigadeführer Heinz Lammerding
9.SS-Panzer-Division "Hohenstaufen"	Brigadeführer Sylwester Stadler
67.Armee-Korps	**General der Infanterie Otto Hitzfeld**
3.Panzergrenadier-Division	Generalmajor Walter Denkert
5.Panzer-Armee	**General der Panzertruppen Hasso von Manteuffel**
Führer Begleit Brigade	Oberst Otto Remer
58.Panzer-Korps	**General der Panzertruppen Walter Krüger**
116.Panzer-Division	Generalmajor Siegfried von Waldenburg
47.Panzer-Korps	**General der Panzertruppen Heinrich von Lüttwitz**
2.Panzer-Division	Oberst Meinrad von Lauchert
Panzer Lehr Division	Generalleutnant Fritz Bayerlein

Lt Gen. Omar Bradley, commander of the 12th Army Group, felt that the Ardennes was an unlikely venue for a major German campaign. The terrain seemed completely unsuitable, especially in the winter months. Allied intelligence had detected the build-up of the Panzer forces in the West, but mistakenly presumed that they were intended to counter-attack the Allies in a climactic battle along the Rhine river sometime in early 1945. As a result, the Ardennes was weakly defended, with the defense consisting mainly of Maj. Gen. Leonard Gerow's V Corps and Maj. Gen. Troy Middleton's VIII Corps of the First US Army. This sector was dubbed the US Army's "*Kindergarten* and old age home." Of the four infantry divisions in the Ardennes, the 4th and 28th Divisions had suffered crippling losses

Besides the Panther tanks, five StuG III assault guns were modified for Panzer Brigade.150. Since they bore no resemblance at all to any US vehicle, their modifications seem rather odd. The bumper code markings were those of the US 5th Armored Division, which was not in the Ardennes at the time.

This M4 medium tank, from G Company, 33rd Armored Regiment, was one of the two tanks involved in the initial defense of Hotton and was knocked out during the fighting on the morning of December 21 with the 116.Panzer Division. It has a large penetration into the transmission cover at the lower front of the tank.

during the recent fighting in the Hürtgen forest and were transferred to the Ardennes for reconstruction. The two other divisions, the 99th and 106th Divisions, were both inexperienced, with the 106th Division arriving only days before the German offensive. In contrast to the German attack force, the initial American defenses in the Ardennes had very modest tank resources, mainly consisting of separate tank battalions attached to the infantry divisions. Elements of the 7th, 9th, and 10th Armored Divisions were in the vicinity of the Ardennes but not fully committed to the fighting until after the start of the offensive. The chart below shows the allotment of US armored divisions by the dates they were committed to the Ardennes sector.

US Armored Divisions in the Ardennes December 1944–January 1945

First US Army	**Lt Gen. Courtney Hodges**		
9th Armored Division	Maj. Gen. John Leonard	December 16, 1944	Army reserve
7th Armored Division	Maj. Gen. Robert Hasbrouck	December 16, 1944	VIII Corps
"	"	December 20, 1944	XVIII Airborne
3rd Armored Division	Maj. Gen. Maurice Rose	December 19, 1944	XVIII Airborne
"	"	December 23, 1944	VII Corps
2nd Armored Division	Maj. Gen. Ernest Harmon	December 22, 1944	VII Corps
5th Armored Division	Maj. Gen. Lunsford Oliver	December 23, 1944	V Corps
Third US Army	**Lt. Gen. George Patton**		
10th Armored Division*	Maj. Gen. William Morris	December 17, 1944	VIII Corps
4th Armored Division	Maj. Gen. Hugh Gaffey	December 19, 1944	III Corps
11th Armored Division	Brig. Gen. Charles Kilburn	December 23, 1944	VIII Corps
"	"	December 31, 1944	XII Corps
6th Armored Division	Maj. Gen. Robert Grow	December 25, 1944	XII Corps
"	"	December 28, 1944	III Corps

*Combat Command B was assigned to the First US Army, December 19

The *Herbstnebel* operation went awry almost from the start. The *Schwerpunkt* in the northern sector facing the Elsenborn ridge became bogged down almost immediately due to the poor road networks along the Belgian frontier, compounded by the muddy ground conditions. The infantry divisions that were supposed to overcome the initial American defenses failed to do so, causing fatal delays in the dispatch of the Panzer exploitation force. Kampfgruppe (KG) Peiper of the 1.SS-Panzer-Division made a rapid thrust through the undefended Losheim Gap but quickly lost communications with the rest

Tiger II number 332 of 3./s.SS-Pz.Abt.501 was abandoned by Kampfgruppe Peiper near La Gleize and later shipped to Aberdeen Proving Ground in Maryland, where it is seen here in the late 1940s at the Ordnance Museum.

of I.Panzer-Korps. It became trapped around La Gleize, held up by newly arrived US infantry reinforcements from the 30th Infantry Division and 82nd Airborne Division. It was eventually forced to retreat out of the pocket, leaving its Panzers behind. Its neighbor, the 12.SS-Panzer-Division, became caught up in the enormous traffic jams on the roads leading into the Losheim area, the only good road network towards the Meuse river. The congestion on this road prompted the division to try to push SS-Panzer-Regiment.12 through narrow forest roads in the Krinkelterwald, leading to a bruising fight with the 2nd Infantry Division for the town of Krinkelt-Rocherath, where most of the regiment's tanks were knocked out or disabled. The remainder of the division was frustrated in a similar fight for the Dom Bütgenbach manor farm against elements of the 1st Infantry Division, which led to heavy losses in its attached tank destroyer battalion.

Within three days of the start of *Herbstnebel*, I.Panzer-Korps had failed to breach the American defense line or to reach the Meuse. For all intents and purposes, the failure in this sector doomed *Herbstnebel*, since it offered the quickest route to the Meuse and Antwerp. Time was not in the Wehrmacht's favor, and the US Army began rushing reinforcements into the Ardennes.

The 5.Panzer-Armee was more successful in creating breaches in the American defenses. Manteuffel ignored Hitler's instructions about relying on an artillery barrage to pave the way for the infantry. Instead, he used 1918-era infiltration tactics to move special

An M36 90mm GMC moves forward in support of the 82nd Airborne Division's attempt to halt the advance of Kampfgruppe Peiper near Werbomont, Belgium, on December 20, 1944. This may be one of the vehicles of the 740th Tank Battalion, which collected a motley assortment of vehicles from ordnance depots.

An M4A3 (76mm) of C Company, 774th Tank Battalion, passes a knocked-out Panther Ausf. G of the 9.SS-Panzer-Division southeast of Bihain on January 17, 1945, while supporting the 83rd Infantry Division. This Panther was presumably the one knocked out by the 3rd Platoon, B Company, 774th Tank Battalion on January 13, 1945.

infantry assault detachments through the thin American lines "like drops of rain" before the defenders realized an offensive was underway. In this fashion, the German infantry cut off the 106th Infantry Division, forcing most of the unit to surrender. The badly decimated 28th Division put up a stiff fight on the approaches to Bastogne but was finally crushed by an overwhelming force. The success of the 5.Panzer-Armee led to the transfer of the II.SS-Panzer-Korps from Dietrich's 6.Panzer-Armee to Manteuffel's 5.Panzer-Armee, its goal being to propel two Panzer spearheads to the Meuse, one through the Bastogne area towards Dinant and the other via Manhay over the Tailles plateau.

In the event, the delays in the German advance caused by the US infantry defenses ultimately doomed the 5.Panzer-Armee attack. By the time, around

A

1: PANTHER AUSF. G, 1./SS-PANZER-REGIMENT 1, KAMPFGRUPPE PEIPER, 1.SS-PANZER-DIVISION "LEIBSTANDARTE ADOLF HITLER"

This Panther was commanded by Ustuf. Hans Hennecke. It was hit by US antitank-gun fire on the right rear side during the fighting in Stavelot on the morning of December 18, repaired, and then abandoned in front of La Gleize town hall during the retreat. In the fall of 1944, the Heereswaffenamt instituted a policy of having tank camouflage applied at the factory rather than at unit or depot level in order to conserve paint. This tank was finished in a pattern typical of the Daimler-Benz factory. This consists of the usual camouflage colors of RAL 7028 dark yellow, RAL 6003 olive green, and RAL 8017 red brown, with a small dapple pattern of dark yellow spots over the darker colors. The tactical number on the turret is a bit of a mystery and appears to be painted in red or another color rather than the more typical black. The tactical number is repeated on the side of the gun housing, a pattern typical of the 1.SS-Panzer-Division in the summer of 1944.

2: PANTHER AUSF. G, 3./SS-PANZER-REGIMENT 12, 12.SS-PANZER-DIVISION "HITLERJUGEND"

This was the tank of Hauptsturmführer Kurt Brödel, commander of the 3.Kompanie. This was probably a Befelspanzer with the additional radios, though this is difficult to determine from surviving photos. Brödel's tank was knocked out during the fighting for Krinkelt-Rocherath. It is finished in a MAN factory scheme of dark yellow, olive green, and red brown. The SS-Panzer-Regiment 12 avoided the stereotyped tactical number system, using the non-descript "xx5" tactical number for the company commander rather than attracting attention with an "xx0" or "xx1" number.

1

2

Christmas, that the penetrations had been made, the US Army had rushed its two heavy tank divisions, the 2nd and 3rd Armored Divisions, to block them. The spearheads of the Bastogne attack, the 2.Panzer-Division and 9.Panzer-Division, were surrounded and defeated in the Celles pocket northwest of Bastogne by the 2nd Armored Division. The 3rd Armored Division managed to plug the gap in the center against the 116.Panzer-Division and units of the II.SS-Panzer-Korps in a series of ferocious tank battles around Manhay and Hotton.

By Christmas, *Herbstnebel* had reached its high-water mark and Rundstedt asked Berlin's permission to go over to the defensive. By this time, Bradley's 12th Army Group had been reinforced by three corps from Patton's Third US Army, which made a bold winter move north from the Saar region to Belgium. The first tanks from Patton's 4th Armored Division began entering the Bastogne perimeter on the day after Christmas. Although the German offensive had failed, it would take another three weeks of bitter winter fighting for the US Army to recover the terrain lost in the initial German assault.

THE TANKS, DOCTRINE, AND ORGANIZATION

Wehrmacht

The German Panzer divisions in the West were largely destroyed in Normandy and had to be completely rebuilt to take part in the Ardennes offensive. The table opposite based on German records, shows the extent of these losses. It should be noted that the German reporting system was misleading and probably incomplete. The German Army had a habit of keeping knocked-out tanks on strength if they were recovered and still in German hands. This is most evident in the reports on tank casualties in the Normandy campaign, when many tanks that were knocked out but still in German hands were not written off until September 1944 after the defeat in France and Belgium. This creates a misleading impression of tank combat losses in June–August.

A PzKpfw IV Ausf. J of the 5./Panzer-Regiment.16, 116.Panzer-Division, knocked out in the intense fighting around Hotton, Belgium, in late December 1944 during encounters with the 3rd Armored Division.

German AFV Losses in the West: June–November 1944							
	Jun	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Total**
Panzer	227	297	114	1,371	74	95	2,178
Sturmgeschütz	27	68	112	383	109	52	751
Panzerjäger	29	15	24	244	48	43	403
Total	**283**	**380**	**250**	**1,998**	**231**	**190**	**3,332**

As a consequence of the heavy losses in the summer fighting, the Wehrmacht's Panzer strength in the West had nearly evaporated, as revealed in the chart below, with only 59 tanks and 23 AFVs still operational with Heeresgruppe B. This chart does not include the Panzer brigades that were hoarded for the ill-fated Lorraine Panzer offensive, since at the time they were still in neighboring Heeresgruppe G. In the event, these brigades were largely destroyed in late September 1944 in a confrontation with Patton's Third US Army that led to the loss of about 340 Panzers and AFVs.

Operational German Tank and AFV Strength, Heeresgruppe B, September 12, 1944					
Type	**Panther**	**PzKpfw IV**	**StuG**	**JgPz IV**	**Stu.Pz.IV**
1.SS-Pz.Div.	–	–	–	–	–
2.SS-Pz.Div.	–	2	–	–	–
9.SS-Pz.Div.	–	2	–	8	–
12.SS-Pz.Div.	1	2	–	–	–
17.SS-Pz.Gren.Div.	–	–	2	–	–
2.Pz.Div.	–	–	–	2	–
9.Pz.Div.	–	2	–	5	–
21.Pz.Div.	–	–	–	–	–
116.Pz.Div.	19	2	–	4	–
Pz.Lehr Div.	11	18	–	–	–
Stu.Pz.Abt.217	–	–	–	–	2

As a consequence of the heavy losses suffered in the summer of 1944, the Panzer divisions in the West were withdrawn for reconstruction. To reach their full authorized KStN strength (*Kriegsstärkenachweisungen*: war establishment strength), the four Heer and four Waffen-SS Panzer divisions that were earmarked for the Ardennes campaign required about 1,575 tanks and AFVs: 715 PzKpfw IVs, 610 Panthers, and 310 Pz IV Lg (V)s. German production goals were to manufacture about 900 of these per month in the autumn of 1944, but actual monthly production averaged only 740. This was due in part to an Allied bombing campaign against the German tank plants that started in August 1944. The main Panther plant, MAN at Nürnberg, was hit on September 10, 1944, costing the Wehrmacht over four months' production, or about 645 tanks. Attacks on the Henschel Tiger plant in Kassel resulted in the loss of nearly three months of production, or about 700 Tiger II tanks. As a result of the shortfalls in production, the reconstruction of the eight Ardennes Panzer divisions would have absorbed nearly all of the September–November 1944 production of the three critical types. This was obviously impossible since the divisions elsewhere, especially on the Russian Front, were also in dire need of replacement tanks.

As a result of the shortage of tanks, the Inspector General of the Panzer Forces (Generalinspekteur der Panzertruppe), Generaloberst Heinz Guderian, was obliged to reconfigure the Panzer divisions with smaller

allotments of the premium tank types. The goals for armored vehicle equipment for the West was issued in October 1944 and can be seen in the chart below.

Reduced Establishments for Panzer Units in the West, October–November 1944

	Pz. IV	Panther	Tiger	StuG	JgPz 38	Pz. IV Lg	J-pant	J-tiger
1.SS-Pz.Div.	34	38	–	–	–	21	–	–
2.SS-Pz.Div.	30	60	–	28	–	21	–	–
9.SS-Pz.Div.	30	60	–	28	–	21	–	–
10.SS-Pz.Div.	34	38	–	–	–	21	–	–
12.SS-Pz.Div.	34	38	–	–	–	21	–	–
Pz.Lehr Div.	34	38	–	–	–	21	–	–
2.Pz.Div.	30	60	–	28	–	21	–	–
9.Pz.Div.	30	60	–	14	–	21	–	–
11.Pz.Div.	58	60	–	–	–	21	–	–
21.Pz.Div.	34	38	–	–	–	21	–	–
116.Pz.Div.	30	60	–	14	–	21	–	–
3.Pz.Gren.Div.	–	–	–	45	–	31	–	–
15.Pz.Gren.Div.	–	–	–	45	–	31	–	–
25.Pz.Gren.Div.	11	36	–	31	–	–	–	–
17.SS-Pz.Gren.Div.	–	–	–	45	–	31	–	–
Pz Brig.106	11	36	–	–	–	–	–	–
Führer-Gren. Brig	11	35	–	14	–	–	–	–
Führer-Begl. Brig	22	–	–	5	–	–	–	–
Pz Abt.301 (Fkl)	–	–	31	–	–	–	–	–
s.SS-Pz.Abt.501	–	–	45	–	–	–	–	–
s.Pz.Abt.509	–	–	45	–	–	–	–	–
StuPz.Abt.217	–	–	–	45*	–	–	–	–
Pz.Komp.319	–	–	–	10	–	–	–	–
Pz.Jg.Abt. (7)	–	–	–	–	31	124	101	45
StuG Brig. (9)	–	–	–	279	–	–	–	–
PzJg. Komp-Inf.Div. (36)	–	–	–	180	252	–	–	–
II./Grossdeutschland	45	–	–	–	–	–	–	–
II./2.Pz.Rgt	17	–	–	–	–	–	–	–
Total	495	657	121	811	283	448	101	45

**Sturmpanzer IV*

Hitler insisted that the Panzer divisions be retained in reserve for use in the Ardennes so as not to repeat the mistakes of the Lorraine Panzer offensive, when the tank brigades were frittered away in piecemeal commitments to deal with local tactical setbacks. This proved impossible due to continued Allied offensives. Operation *Queen*, the First US Army's November offensive towards the Roer, and Operation *Madison*, the Third US Army's November offensive towards the Saar, forced OB West to make limited commitment of Panzer units to restrain the American advances. As a result, Heer Panzer divisions remained in combat through October–December 1944 while the Waffen-SS divisions were sheltered in reserve. Deployed Panzer strength along the Western Front in late 1944 was very meager, as can be seen in the chart opposite. Units under reconstruction in Germany were not counted in these figures since they were in the strategic reserve and not yet assigned to OB West.

Operational Tanks and AFVs in Panzer Divisions, Panzergrenadier Divisions and Panzer Brigades in the West, Oct–Dec 1944					
	PzKpfw IV	**Panther**	**Panzer IV/70**	**StuG III**	**Total**
Oct 1, 44	22	151	29	13	**215**
Nov 1, 44	66	130	36	4	**236**
Dec 1, 44	132	100	60	45	**337**

Due to the priority afforded to the Ardennes offensive, the distribution of new tanks favored the West over the East during October–December 1944. This priority abruptly changed in January 1945, as can be seen on the chart below.

Delivery of New German Tanks/AFVs, November 1944–January 1945 by Theater				
	Nov 44	**Dec 44**	**Jan 45**	**Total**
Pz. IV	205	47	58	310
Panther	281	191	85	557
Tiger	26	6	6	38
StuG	382	361	82	825
Pz. IV Lg (A)	49	0	25	74
Pz. IV Lg (V)	135	128	17	280
Jagdpanther	20	49	36	105
Jagdpanzer 38	218	137	24	379
Jagdtiger	9	16	6	31
Sturmpanzer	20	17	4	41
West subtotal	*1,345*	*952*	*343*	*2,640*
Pz. IV	10	65	120	195
Panther	83	48	154	285
Tiger	20	46	55	121
StuG	102	231	431	764
Pz. IV Lg (A)	0	24	37	61
Pz. IV Lg (V)	0	82	98	180
Jagdpanther	0	0	42	42
Jagdpanzer 38	73	135	327	535
East subtotal	*288*	*631*	*1,264*	*2,183*

The only Tiger I tanks to serve in the Ardennes campaign belonged to Kompanie Hummel, attached to s.Pz.Abt.506 as a fourth company. This particular tank was found destroyed near Oberwampach, Luxembourg, and is seen here with a forward observer team of the 358th Infantry, 90th Division, on January 21, 1945.

There were substantial differences between the Wehrmacht and the US Army in the organization of their armored forces. The Wehrmacht deployed both Panzer and Panzergrenadier divisions; the US Army only deployed armored divisions and had no specific equivalent of the Panzergrenadier divisions. Most German tanks were concentrated in the Panzer divisions. The main exceptions were the Tiger heavy tanks that were organized into separate heavy tank battalions (schwere Panzer Abteilungen).

This Tiger II belonged to s.Pz.Abt.506 and was abandoned near Villers-la-Bonne-Eau, south of Bastogne, in January 1945. It is being inspected by troops of the 320th Infantry, 35th Division.

The German Panzer divisions changed significantly over the course of World War II, and by 1944 had fewer tanks and were more defensively oriented than during the 1939–41 Blitzkrieg era. One of the major differences between German and US tank divisions was the balance between the tanks and mechanized infantry. The US divisions had an equal allotment of three tank battalions, three armored infantry battalions, and three armored artillery battalions. (The exceptions were the 2nd and 3rd Armored Divisions, as detailed below.) In contrast, the German balance reflected the defensive posture of the Wehrmacht after 1943, favoring greater infantry strength and less armored strength. The 1944 Panzer divisions had two regiments (six battalions) of Panzergrenadiers and only one Panzer regiment (two battalions).

None of the German Panzer divisions in the Ardennes were up to full KStN strength, even the Waffen-SS divisions. For example, the 12.SS-Panzer-Division "Hitlerjugend," nominally an elite formation, was substantially understrength in tanks, with only 78 instead of the authorized 195. The official KStN pattern was for each Panzer regiment to include a Panther battalion and a PzKpfw IV battalion. Instead, 12.SS-Panzer-Division consolidated its Panthers and PzKpfw IVs into a single mixed battalion, and schwere Panzerjäger-Abteilung 560 (Heavy Tank Destroyer Battalion) was attached to the division as a substitute for the missing tank battalion. Likewise, 1.SS-Panzer-Division had only a single mixed tank battalion, but had the s.SS-Pz.Abt.501 Tiger II battalion attached.

There were some differences in the KStN between the Heer (army) and Waffen-SS armored divisions, mainly in a more lavish authorized strength of the Waffen-SS. Once again, the KStN were not rigidly followed due to shortages of equipment and personnel, so division strength varied widely.

B

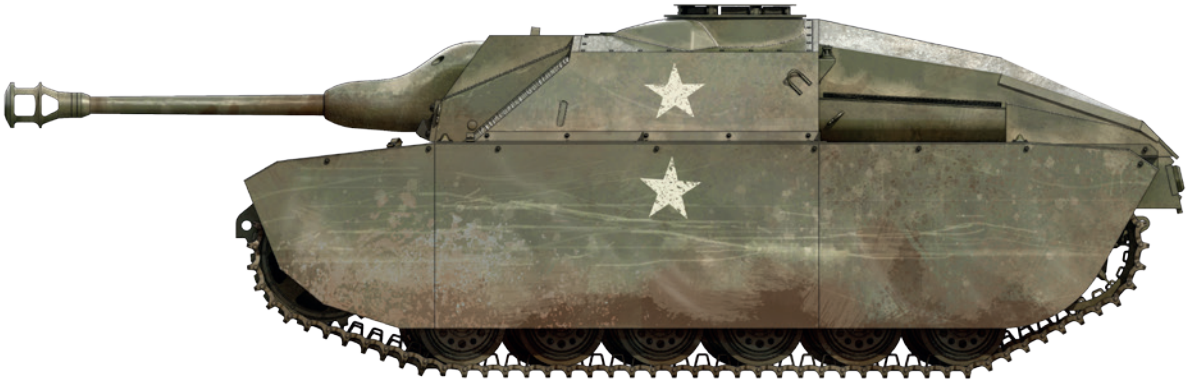
1: STUG III, AUSF. G, KAMPFGRUPPE Y, II./PANZER-BRIGADE.150 "RABENHÜGEL"

The armored vehicles of Panzer-Brigade.150 were marked to resemble American vehicles, though the StuG III disguise bore little resemblance to any American vehicle. "Rabenhügel" had an internal set of markings, such as painting X, Y, or Z, on helmets and other items to identify the three battlegroups. However, this wouldn't pass for American markings so one of the brigade staff officers, Hans-Dieter Wegner, decided to give them normal American bumper codes. The brigade staff was unaware of what units they were facing, so the StuGs were marked as C Company, 81st Tank Battalion, 5th Armored Division, even though this division was not in fact in the Ardennes. The vehicles were painted overall in olive drab, though it is unknown whether this was from captured stocks of paint or simply an improvisation using German olive green paint.

2: PANTHER AUSF. G "ERSATZ M10", KAMPFGRUPPE Z, III./PANZER-BRIGADE.150 "'RABENHÜGEL"

As in the case of the other "Rabenhügel" armored vehicles, the Panthers were painted in American markings. These vehicles had a sheet-metal disguise to resemble American M10 tank destroyers, arguably a more convincing arrangement than on the StuG III. The brigade was originally assigned five Panthers, but only four actually took part in the fighting. The four Panthers were numbered B-4, B-5, B-7, and B-10 and were marked as B Company, 10th Tank Battalion, 5th Armored Division. For reasons that are unclear, an additional "X" marking was carried on the upper right corner of the glacis plate.

1



2

On average, the Waffen-SS Panzer division in 6.Panzer-Armee had 131 tanks and AFVs each, while the Heer Panzer divisions in the 5.Panzer-Armee had an average of 91 each.

The Panzergrenadier division was very similar to the Panzer division. The most obvious difference was that the 1944 pattern division had a Panzer-Sturmgeschütz-Abteilung instead of a Panzer regiment. These divisions were relatively uncommon in the Ardennes.

The Panzer and Panzergrenadier divisions included about 53 percent of the tank and AFV strength of the Wehrmacht units earmarked for the Ardennes offensive. The remaining strength was contained in a variety of specialized units, mostly those configured for infantry support.

There were a few types of Panzer units used in the Ardennes other than the Panzer divisions. Panzer-Brigade.106 was the sole survivor of these short-lived brigades. They were actually intended for use on the Russian Front as a mobile counterattack force. They had seen their combat debut in the West in September during the Lorraine Panzer offensive. The brigades proved to be badly configured and the remnants were absorbed into neighboring Panzer divisions. Panzer-Brigade.106 survived, probably because it was one of the semi-elite Feldherrnhalle formations. Panzer-Brigade.150 "Rabenhügel" was not an actual brigade, but rather a special-purpose unit under the command of Hitler's favorite rogue, Otto Skorzeny. It was supposed to be equipped with US Army tanks, equipment, and uniforms. Its mission, codenamed Operation *Greif*, was to infiltrate behind American lines and create chaos. In the event, not enough functioning American tanks could be located and the brigade instead received five Panther tanks and five StuG III assault guns disguised as American AFVs. The schwere Panzer Abteilungen were the Tiger heavy tank battalions. Two of these were deployed to the Ardennes, one Waffen-SS and one Heer.

There were two special Führer Panzer units committed to the Ardennes, the Führer Grenadier Brigade and the Führer Begleit (Escort) Brigade. Both stemmed from Heer units assigned to guard Hitler's headquarters. They were essentially rump Panzergrenadier formations.

The remaining Panzer units assigned to the Ardennes were an assortment of self-propelled gun units. The Panzerjäger-Abteilungen, as their name implies, were tank destroyer battalions. The s.Pz.Jag.Abt. used either the new Jagdpanther or Jagdtiger tank destroyers, often supplemented with the Panzer IV lg.(V) due to shortages of the Jagdpanther. The German tank destroyer battalions were far fewer in number than their American counterparts.

A StuG III Ausf. G of the Führer-Grenadier-Brigade knocked out during the fighting for Heiderscheid, Luxembourg, around Christmas Day by Patton's Third US Army. The brigade had StuG-Brigade.911 attached to it during the Ardennes campaign.

The StuG brigades, contrary to their name, were in fact battalion-sized assault gun formations, equipped with the StuG III or StuG IV assault guns. These were essentially the equivalent of the US Army's separate tank battalions, used to provide infantry fire support. They were fewer in number than

their American counterparts and were generally retained under corps control rather than divisional control since there were not enough to spread around to all the infantry divisions.

The German 1944 infantry divisions were authorized a Panzerjäger-Abteilung, usually consisting of a company of towed 7.5cm PaK 40 antitank guns and a company of assault guns. The assault guns were originally the StuG III, but many newer formations received the low-cost Jagdpanzer 38 Hetzer. In contrast, most US infantry divisions had a separate tank battalion and tank destroyer battalion attached during combat operations, giving them more than three times the number of supporting AFVs.

A StuG IV assault gun of Pz.Jg.Abt.1012 of the 12.Volksgrenadier-Division, knocked out near Losheimergraben while fighting with elements of the 394th Infantry, 99th Division, on the first day of the offensive. This unit received six of these vehicles for the offensive.

Operational Panzer Strength in the Ardennes Sector, December 16, 1944

	Pzkpfw IV	Panther	Tiger	Pz IV lg	Jagdpanther	StuG	JgPz 38
6.Panzer-Armee							
1.SS-Pz.Div.	34	37	30	20	–	–	–
12.SS-Pz.Div.	39	41	–	47	12	–	–
2.SS-Pz.Div.	28	58	–	20	–	28	–
9.SS-Pz.Div.	32	49	–	21	–	28	–
Pz.Bde.150	–	5	–	–	–	5	–
s.Pz.Abt.506	–	–	8	–	–	–	–
Panzerjager units	–	–	–	9	7	17	–
StuG Brigades	–	–	–	–	–	28	–
Infantry Div. companies	–	–	–	–	–	6	16
Sub-Total	*133*	*190*	*38*	*117*	*19*	*112*	*16*
5.Panzer-Armee							
2.Pz.Div.	26	49	–	–	–	45	–
9.Pz.Div.	28	37	–	10	–	–	–
116.Pz.Div.	26	43	–	13	–	–	–
Pz.Lehr Div.	30	23	–	14	19	–	–
StuG Brigades	–	–	–	–	–	32	–
Infantry Div. companies	–	–	–	–	–	–	28
Sub-total	*110*	*152*	–	*37*	*19*	*77*	*28*
7.Armee							
Infantry Div.	–	–	–	–	–	32	6
Sub-total	–	–	–	–	–	*32*	*6*
Reinforcements							
Infantry Div. companies	–	–	–	–	–	–	40
Panzerjager Abt.	–	–	–	–	–	–	20
Sub-total	–	–	–	–	–	–	*60*
15.Armee	14	–	–	20	–	63	35
OB West Reserve	99	126	–	97	9	102	30
Total	*356*	*468*	*38*	*271*	*47*	*386*	*175*

An M5A1 light tank of the 3rd Armored Division knocked out in Hotton during the fighting on the morning of December 21 with the 116.Panzer-Division.

US Army

V Corps, defending in the Ardennes at the outset of the German offensive, had modest numbers of tanks, since an attack was not anticipated in this sector. The principal formations were four infantry divisions. US infantry divisions typically had an attached tank battalion and an attached tank-destroyer battalion. V Corps, the main target of the German attack, was very weak in tanks, with only three tank battalions on hand, two of which were in the northern sector away from the main German attack. Once the German offensive began, elements of nearby US armored divisions were rushed into the area, with combat commands from the 7th and 9th Armored Divisions sent to the St. Vith area, and elements of the 10th Armored Division sent to Bastogne. US armored reinforcements continued to flow into the Ardennes through December and early January, with the armored force eventually totaling nine armored divisions, 17 separate tank battalions, and 25 tank destroyer battalions.

At the outset of the Ardennes offensive, the tank units of Hodge's First US Army had 88 percent of their authorized TO&E (Tables of Organization & Equipment) strength while Patton's Third US Army had 84 percent. Of the tanks on hand, 90 percent of the First US Army tanks were operational and the remainder in short-term (24-hour) or long-term (more than 24 hours) repair; for the Third US Army the figure was 92 percent. Unlike the German practice, it was US policy to try to keep units as close to their authorized TO&E strength as possible. However, the US Army had underestimated the likely monthly tank loss in the ETO and was still in the process of increasing the replacement allotment when the Ardennes campaign began.

First US Army Tank Status, December 16, 1944

	M4	M4 (105mm)	M5A1	M8 75mm HMC	Dozer	TRV
Operational	787	104	501	60	41	105
Short-term repair	115	9	17	4	6	6
Long-term repair	7	0	4	0	0	1
Sub-total	*909*	*113*	*522*	*64*	*47*	*112*
Authorized	**1,054**	**135**	**554**	**34**	**106**	**130**

Third US Army Tank Status, December 16, 1944

	M4	M4 (105mm)	M5A1	M8 75mm HMC	Dozer	TRV
Operational	668	89	341	48	15	85
Short-term repair	72	1	21	3	2	8
Long-term repair	1	0	0	0	0	0
Sub-total	*741*	*90*	*362*	*51*	*17*	*93*
Authorized	**882**	**123**	**387**	**24**	**96**	**107**

US armored divisions in the Ardennes generally followed the 1943 "light" TO&E, which had a balanced mix of three tank, three armored infantry, and three armored artillery battalions.[1] Two divisions, the 2nd and 3rd Armored Divisions, followed a modified version of the earlier 1942 "heavy" TO&E, since they were already in Britain in 1943 when the change was made and the theater commander did not want the disruption of adopting the new tables. The heavy configuration was not well suited to typical missions, since it had six tank battalions and only three armored infantry battalions. To make up the imbalance, it was usually the practice to team the heavy divisions with one or more infantry regiment from a neighboring infantry division. This resulted in a versatile and powerful formation that was nearly equivalent to an armored corps. As a result, the 2nd and 3rd Armored Divisions were the principal counterattack force of the First US Army against 5.Panzer-Armee during the Christmas battles.

Curious GIs look over one of the new M24 Chaffee light tanks of the 740th Tank Battalion in the village of Nonceveux on January 19, 1945. Two of these were diverted by the battalion when it arrived in the Ardennes without any tanks. The battalion supported the 82nd Airborne Division in the fighting against Kampfgruppe Peiper.

The US Army followed a combined-arms doctrine that was based around a brigade headquarters called a combat command. Each division had three of these: CCA, CCB, and CCR (Reserve). Each combat command would typically include a tank, armored infantry, and armored artillery battalion, plus smaller allotments of divisional troops such as a company of armored engineers. During the initial phase of the Ardennes campaign, it was frequent practice to split up the armored divisions and send combat commands to carry out separate missions.

1 Steven Zaloga, *US Armored Divisions: The European Theater of Operations 1944–45*, Osprey Battle Orders 3 (2004)

An M4A3 medium tank of the 3rd Armored Division moves through Langlir, Belgium, on January 13, 1945.

Tank crews of the 3rd Armored Division near Ottré, Belgium, around January 13, 1945. The tank on the left is one of the M4A1s (76mm) that the division received in mid-July 1944 prior to Operation *Cobra*. The tank on the right is one of the heavily armored M4A3E2 assault tanks, of which there were six in the division at the time of the Ardennes offensive.

The separate tank battalions were nominally under corps control and directed by an armored group headquarters.[2] The original idea was that the armored group could mass these battalions together as a concentrated tank force for corps operations. In practice, the tank battalions were usually distributed on a scale of one per infantry division, with each infantry regiment receiving a supporting tank company. The battalions had four tank companies: three (Cos A–C) of M4 medium tanks and Co. D with M5A1 light tanks. By this stage of the war, the M5A1 was too weakly armed and armored, so they were assigned secondary missions or kept as a divisional reserve.

Armored Groups in the Ardennes	
First US Army	
3rd Armored Group	V Corps
6th Armored Group	VII Corps
9th Armored Group	XVIII (Airborne) Corps
Third US Army	
12th Armored Group	VIII Corps
17th Armored Group	XII Corps
none	III Corps

As in the case of the separate tank battalions, the tank destroyer battalions were nominally controlled by a tank destroyer group headquarters at corps level. In practice, they were usually distributed on a scale of one per infantry division, like the tank battalions.

The separate tank destroyer battalions were in a state of flux at the end of 1944. In 1943, the US Army, seriously misreading the lessons of combat in Tunisia, had begun to convert some of the self-propelled battalions into towed battalions using the towed 3in antitank gun. These towed battalions

2 Steven Zaloga, *US Tank and Tank Destroyer Battalions in the ETO 1944–45*, Osprey Battle Orders 10 (2005)

C

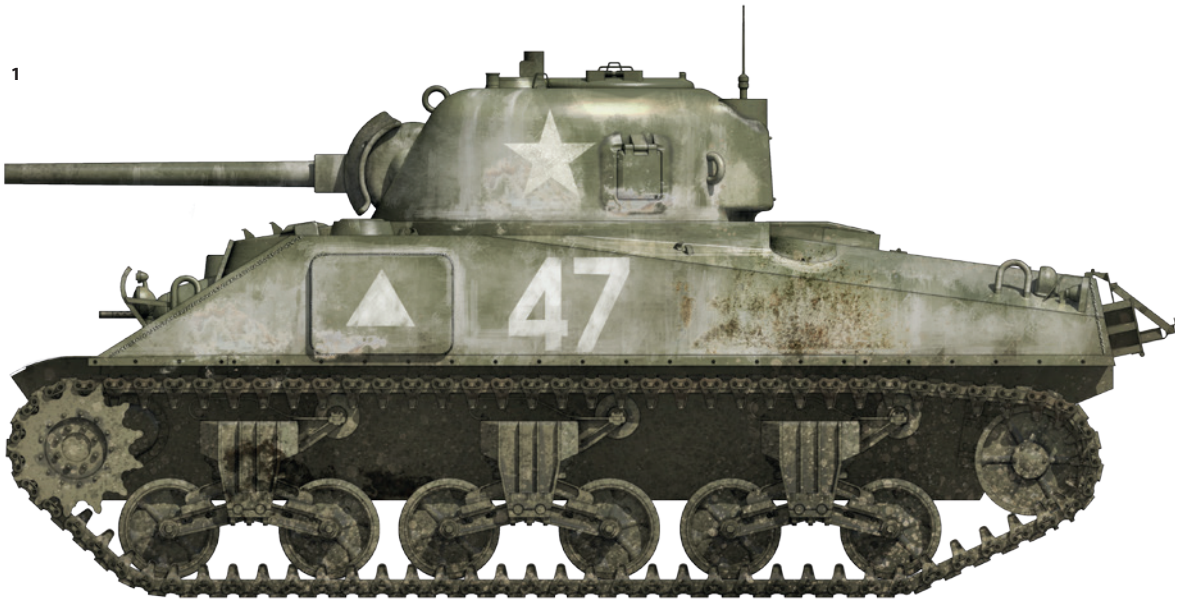
1: M4 MEDIUM TANK, B COMPANY, 68TH TANK BATTALION, 6TH ARMORED DIVISION, JANUARY 1945

The 6th Armored Division was one of the few US armored divisions to use a distinctive style of divisional insignia. This consisted of large tactical numbers that indicated the tanks within the three battalions, and a geometric design to identify the battalion. The 68th Tank Battalion usually used a white triangle, as seen here. The tactical numbers identified the tanks within a company, with 11–19 for HQ Company, 21–38 for A Company, 41–58 for B Company, 61–78 for C Company, and 81–98 for the light tanks of D Company. The division began to whitewash its tanks after the onset of winter snow in late December. They usually used a mixture of water and lime that was not particularly durable.

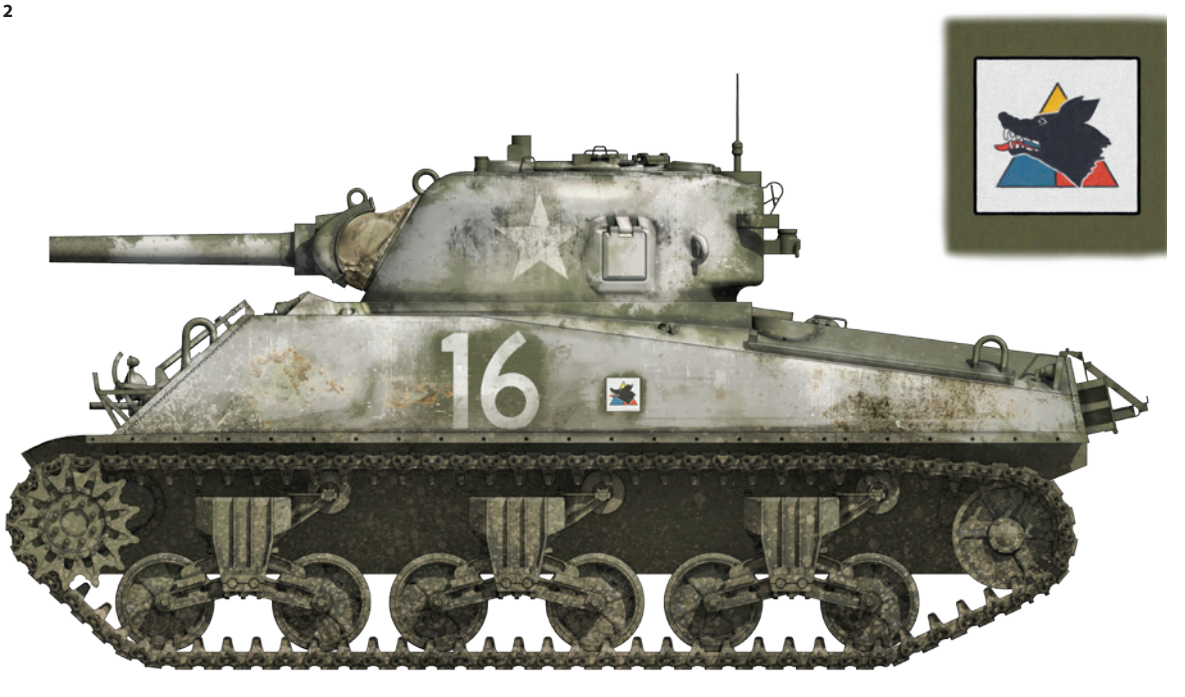
2: M4 (105mm) ASSAULT GUN, HEADQUARTERS COMPANY, 15th TANK BATTALION, 6th ARMORED DIVISION, JANUARY 1945

The 15th Tank Battalion used a square with a wolf's head on the Armored Force tri-color triangle; the 69th Tank Battalion used a black panther on a star. The tactical numbers were the same as described above, so this assault gun can be identified as one of those in the Headquarters Company assault gun platoon.

1



2



The 11th Armored Division prepares to move out on a mission in support of the 101st Airborne Division near Foy, Belgium, on January 13, 1945. The two tanks in the foreground are the newest version of the Sherman, the M4A3E8 (76mm), which began to be deployed in the Ardennes sector around Christmas 1944.

proved to be a grave mistake when deployed in combat in Normandy, since they lacked the protection and mobility of the self-propelled guns. They were gradually reorganized with self-propelled guns in 1944–45, though at the time of the Ardennes fighting, eight of the 25 separate tank destroyer battalions in the Ardennes were either towed or in the process of conversion. The poor performance of these towed battalions in the Ardennes led to plans to completely convert them in 1945. The self-propelled battalions had originally been equipped with the M10 3in GMC, though some of the newer M18 76mm GMC began appearing in the ETO in the summer of 1944, mainly in the battalions that were attached to armored divisions. The best of the tank destroyers was the new M36 90mm GMC, based on the M10 but fitted with a much more powerful 90mm gun. This was the first US Army weapon capable of penetrating the Panther tank frontally. These began arriving in the ETO in October 1944, and were usually issued a company at a time to the existing M10 battalions.

Besides these formations, there were also five cavalry groups with the First and Third US Armies. These each had two cavalry reconnaissance squadrons and were used for a wide range of cavalry missions, including scouting and flank security. They were equipped with light tanks and armored cars. At the start of the Ardennes campaign, the cavalry units of First US Army had 120 M5A1 light tanks, 36 M8 75mm HMCs, and 240 M8 armored cars; Third US Army had a similar number but committed only a portion of these to the Ardennes campaign, totaling about 80 M5A1 light tanks, 24 M8 75mm HMCs, and 160 M8 armored cars.

There were plans to deploy one mine-exploder tank battalion in each field army to permit each corps to be supported by a mine exploder company. The 738th Tank

One of the overlooked versions of the Sherman tank was the M4 (105mm) assault gun. This resembled the normal 75mm tank, but can be distinguished by the thicker gun tube and different gun mantlet. This is an example from the assault gun platoon, HQ Company, 750th Tank Battalion, during a fire mission in the Manhay area on December 30, 1944, in support of the 75th Infantry Division.

An M4 tank fitted with a T1E3 mine roller, belonging to the 738th Tank Battalion (MX), passes through a cemetery in Recht, Belgium, on January 18, 1945. This was the First US Army's mine exploder battalion, with each corps assigned one company of these for minefield clearing.

Battalion (MX) served with the First US Army in the Ardennes. The 740th Tank Battalion (MX) was rushed to the Ardennes without tanks, serving with the XVIII Airborne Corps against KG Peiper. The battalion was authorized to collect whatever equipment they could find at local depots and so ended up with a motley selection of vehicles, including newly arrived M24 light tanks, M36 90mm GMCs, and British Sherman tanks.

Separate Tank Battalions Attached to Infantry Divisions in the Ardennes Campaign

Tank Battalion	Army	Corps	Infantry Division
70	Third US Army	XII	4
701	First US Army	VII	84
702	Third US Army	XII	80
707	First US Army	V	28, 17
709	First US Army	V	78
712	Third US Army	III	90
735	Third US Army	III, XII	5, 26
737	Third US Army	III, XII	5, 35
738 (MX)	First US Army	Army	–
740	First US Army	XVIII	82
741	First US Army	V	2
743	First US Army	XVIII	30
745	First US Army	V	1
746	First US Army	V	9
750	First US Army	XVIII	75
761	Third US Army	VIII	87
771	First US Army	VII	84
774	First US Army	VII	83

Separate Tank Destroyer Battalions Attached to Infantry Divisions in the Ardennes Campaign

TD Battalion	Army	Corps	Infantry Division	Equipment
602	First US Army	V	28	M18
607	Third US Army	VIII	87	M10
610	Third US Army	VIII	87	M36
612	First US Army	V	2	Towed, M18
628	First US Army	V	78	M10
629	First US Army	VII, XVIII	75, 82, 83	M10
630	First US Army	V	28	Towed, M36
634	First US Army	V	1	M10
638	First US Army	VII	84	M18
643	First US Army	XVIII	82, 106	M18
644	First US Army	V	1, 2, 99	M10
654	Third US Army	XII, III	5, 35	M10
691	Third US Army	VIII	87	Towed
705	First US Army	XVIII	101	M18
772	First US Army	VII, XVIII	75, 83	Towed
773	Third US Army	III	90	M10
774	Third US Army	III, VII	83, 90	Towed
801	First US Army	V, VII	1, 2, 83, 99	Towed
802	Third US Army	XII	4	Towed
803	Third US Army	XII	4, 5	M10
807	Third US Army	III, XII	5, 90	Towed
817	First US Army	V	78	M18
818	Third US Army	III	26	M10/M36
823	First US Army	XVIII	30	M10
899	First US Army	V	9	M10/M36

BELOW LEFT
A pair of M10 3in GMCs of C Company, 773rd Tank Destroyer Battalion, from Patton's Third US Army, that supported the 90th Infantry Division in the Ardennes from early January 1945. This was the highest-scoring tank destroyer battalion of the Ardennes campaign, claiming to have knocked out 103 German tanks.

BELOW RIGHT
The M18 76mm GMC was the fastest US tracked armored vehicle of the war. This particular example is seen with B Company, 638th Tank Destroyer Battalion, in Marcouray, Belgium, on January 10, 1945, while supporting the 334th Infantry, 84th Division. The previous day, the company was credited with the destruction of three PzKpfw IV tanks and a self-propelled gun.

British Tanks in the Battle of the Bulge

British participation in the Battle of the Bulge was on a very small scale, since Montgomery's 21st Army Group was outside the Ardennes on the other side of the Meuse river. Had the Wehrmacht crossed the Meuse as planned, the British Army would have been heavily involved in the campaign.

The most essential contribution of British armor to the Ardennes campaign was the action by the 29th Armoured Brigade around Christmas

When the 2.Panzer-Division began approaching the Meuse river near Dinant in the days before Christmas, the British 29th Armoured Brigade was deployed to key crossing points to prevent the Panzers from getting over the river. Lt Robert Boscawen, commander of 2 Troop, the Coldstream Guards, sits in his Sherman (17-pdr) Firefly guarding one of the bridges over the Meuse at Namur on Christmas Day.

on the approaches to the Meuse near Dinant. Spearheads of the 2.Panzer-Division had penetrated through the American defenses near Bastogne and were the only major German units to come close to their initial objective of the Meuse. At this point, the 29th Armoured Brigade arrived on the scene. Col. Alan Brown's 3rd Royal Tank Regiment began encountering KG Böhm, the reconnaissance battlegroup of the 2.Panzer-Division, on December 24. In a series of short skirmishes, they knocked out a PzKpfw IV Ausf. J south of Achêne at around 1000hrs, and two Panthers at Sorinne an hour later. Much of the rest of KG Böhm was mopped up around Foy-Notre-Dame on December 25–26, including two more Panthers and numerous other vehicles, many of which had run out of fuel. The Shermans of the Coldstream Guards took up positions in Dinant to prevent the Wehrmacht from advancing over the Meuse bridges. Thus the stage was set for the arrival of the US 2nd Armored Division, which subsequently trapped much of 2.Panzer-Division in the Celles pocket nearby.

In late December, Lt Gen. Brian Horrocks' XXX Corps became involved in clearing the Germans from a northern sector of the Bulge. On December 31, the 6th Airborne Division advanced east from Givet to clear the village of Bure, held by Panzergrenadiers of the 116.Panzer-Division. The British airborne troops were supported by the 29th Armoured and 34th Tank Brigades, as well as their own 6th Airborne Armoured Reconnaissance Regiment (AARR). The 2nd Fife and Forfar Yeomanry and 23rd Hussars lost 16 Sherman tanks during this fighting; at least one German tank was knocked out in the village. The neighboring 53rd (Welsh) Division, supported by the 144th Regiment RAC and the 1st Northamptonshire Yeomanry Regiment (33rd Armoured Brigade), cleared the Marche and Griebmont area, starting on January 4, 1945. On January 8, the 51st Highland Division took over this sector and continued the attack, crossing the River Ourthe, and securing the town of La Roche with the support of the tanks of the 1st Northamptonshire (33rd Armoured Brigade). The Guards Armoured Division was in XXX Corps reserve at this time, but did not see extensive combat.

XXX Corps
29th Armoured Brigade
2nd Fife & Forfar Yeomanry
3rd RTR
23rd Hussars
33rd Armoured Brigade
1st Northamptonshire Yeomanry
1st East Riding Yeomanry
144th Regiment RAC
34th Army Tank Brigade
107th Regiment RAC
147th Regiment RAC
7th RTR
9th RTR
Guards Armoured Division

British Tanks in the Ardennes Sector, December 1944					
	Sherman 75mm	**Sherman 17-pdr**	**Churchill**	**Cromwell**	**Comet**
29th Armoured Brigade	112	48	–	18	31
33rd Armoured Brigade	144	72	–	–	–
34th Army Tank Brigade	–	–	195	–	–
Guards Armoured Division	174	56	–	77	–
6th AARR	–	–	–	32	–
Total	**430**	**176**	**195**	**127**	**31**

TECHNICAL FACTORS

Wehrmacht

By 1944, the Wehrmacht had hoped to replace all its existing medium tanks with the Panther, but its high cost and Germany's limited production capacity meant that this never occurred. Instead, Panzer regiments generally had a battalion of Panther tanks and a battalion of PzKpfw IV tanks. Most of the tanks deployed in the Ardennes offensive were newly manufactured in August–October 1944 and so were usually the Panther Ausf. G and the PzKpfw IV Ausf. J.

A Panther Ausf. G of the 9.Panzer-Division knocked out in a battle near Humain, Belgium, with the 2nd Armored Division on December 28, 1944, during attempts to relieve the trapped 2.Panzer-Division in the Celles pocket.

The Panther Ausf. G was a superb vehicle in terms of armored protection, mobility, and firepower. It was the best tank in combat in the Ardennes campaign. Its sloped glacis armor was impervious to all US Army tank guns, except for the new 90mm gun on the M36 tank destroyer and the new HVAP (high-velocity, armor-piercing) ammunition. The Panther's long 75mm gun could penetrate the armor of any existing US Army tank at normal combat ranges, with the exception of the rare M4A3E2 assault tank. It used wide

tracks that gave it lower ground pressure than most American armored vehicles, and so had better mobility in snow and mud. In comparison to Allied tanks, the Panther was a heavy tank, more comparable to the later American M26 Pershing or the Soviet IS-2 than to smaller and lighter tanks such as the M4 Sherman or British Cromwell.[3]

The PzKpfw IV was an older design than the Panther, but was still a capable weapon on the 1944 battlefield. It was equivalent to the M4 (75mm) Sherman medium tank in most technical respects, with a better 75mm gun.[4] During 1944, the plants assigned to the manufacture of the PzKpfw IV gradually shifted away from the standard tank configuration to self-propelled variants with more powerful guns, such as the Pz. IV lg.(V). Only one plant, the Nibelungenwerk, continued to manufacture the turreted version of the PzKpfw IV Ausf. J, and even this plant shifted part of its production to the Pz. IV lg.(V). As a result, the Panther tank outnumbered the PzKpfw IV tanks in the Ardennes campaign.

A pair of tanks of the 116.Panzer-Division, knocked out along Rue de Levant in the outskirts of Hotten around Christmas 1944. In the background is a PzKpfw IV Ausf. J with the tactical number 611, while in the foreground is a Panther Ausf. G with the later-style chin mantlet. Hotton was the scene of heavy fighting, since it covered main road junctions over the Ourthe river.

The Tiger II tank was deployed in modest numbers in the Ardennes in two battalions. In spite of its impressive armor and firepower, its actual combat performance in the West was unimpressive.[5] The s.SS-Pz.Abt.501 supported KG Peiper, but the Tiger II was so clumsy operating along the rural roads in the Belgian countryside that Peiper assigned it to support the faltering 3.Fallschirmjäger-Division. About a third of the battalion reached La Gleize, where they were subsequently abandoned. By January 15, 1945, the battalion had just 18 operational tanks of the original 45, with 14 lost and 13 damaged and in repair. The s.Pz.Abt.506 fought in the Bastogne sector. It was often broken up into separate companies for small missions and had little impact on the campaign. When encountered, it was a terrifying opponent for American tankers. A tanker from the 6th Armored Division recalled a skirmish on January 16: "As we approached the top of the hill, we saw five Tiger

3 Steven Zaloga, *Panther vs Sherman: Battle of the Bulge 1944*, Osprey Duel 13 (2008)
4 Steven Zaloga, *Panzer IV vs Sherman: France 1944*, Osprey Duel 70 (2015)
5 Steven Zaloga, *Pershing vs Tiger: Germany 1945*, Osprey Duel 80 (2017)

D

THE BATTLE FOR THE DOM BÜTGENBACH MANOR FARM, DECEMBER 21, 1944

The 12.SS-Panzer-Division "Hitlerjugend" had been badly beaten up in its initial fight for the "Panzer Graveyard" of Krinkelt-Rocherath against the 38th Infantry, 2nd Infantry Division. After this American regiment withdrew to Elsenborn ridge, the Hitlerjugend attempted to overcome the next obstacle along the road to the Meuse. This was the Dom Bütgenbach manor farm, defended by CT26 (Combat Team 26th Infantry, 1st Infantry Division). The Hitlerjugend attacks on December 18–20 were repulsed, culminating in a final attack on December 21. That day, a few tanks of I./SS-Panzer-Regiment 12 penetrated through the initial US infantry defenses. They reached as far as the manor farm itself, where the regiment's headquarters was located. The HQ was defended by C Company, 703rd Tank Destroyer Battalion, that had 12 M36 90mm GMCs in the vicinity, a few like this one, within the farmyard. By the afternoon, the tank destroyers repulsed the attack, knocking out several German vehicles, including this PzKpfw IV commanded by Sturmmann Heinz Müller of 5.Kompanie, SS-Pz.Rgt.12.

This PzKpfw IV Ausf. J, named "*Lustmolch*" (Happy Salamander), of Kampfgruppe Maucke, Pz.Abt.115, 15.Panzergrenadier-Division, was knocked out in Champs on the approaches to Bastogne in an encounter with the 502nd Parachute Infantry Regiment, 101st Airborne Division, on December 26, 1944. There is a penetration through the turret front armor at the junction of the roof and the mantlet.

Royals waiting for us. Our Sherman tanks were no match for them. Our tank shells bounced off the Royals like ping-pong balls. It was quite a show when the Air Corps came in to take care of them. We had front row seats for the performance." By January 19, the battalion was down to only 17 tanks after being forced to scuttle over a dozen broken-down Tigers that could not be recovered. There was only a single company of the older Tiger I in use in the Ardennes, since production had ended the previous August.

The most common armored vehicle in the Ardennes after the Panther tank was the StuG III Ausf. G assault gun. The StuG III was the workhorse of the Wehrmacht, serving as its infantry tank.[6] It was based on the older PzKpfw III tank, fitted with a version of the 75mm gun used on the PzKpfw IV. It was manned by troops from the artillery branch, and the excellent crew training made these vehicles equally adept at close fire support as well as antitank missions. The StuG III was used in separate brigades at corps-level and in company strength in some infantry divisions. The StuG IV was essentially the same configuration, but based on the PzKpfw IV chassis.

In 1944, the StuG III began to be supplanted by the cheaper Jagdpanzer 38, sometimes called the Hetzer. The Jagdpanzer name was inappropriately applied to this vehicle by the Inspector General of the Panzer Troops, Gen. Guderian, who had subsequently become army chief-of-staff. He had a long-standing grudge against the Sturmartillerie, which he viewed as stealing industrial resources from his beloved Panzer branch. Regardless of its name, the Jagdpanzer 38 was usually deployed in the assault gun role. It was less successful than the StuG III, as it suffered from a cramped and inefficient fighting compartment and had particularly vulnerable side armor.

The most common tank destroyer in the Ardennes was the Jagdpanzer IV, renamed by Hitler on July 18, 1944, as the Panzer IV lg.(V), the suffix "lg." meaning "*lang*" for its long gun and "V" for "Vomag," its production plant. Vehicles manufactured by Alkett had the suffix (A), but this type was not widely used in the Ardennes. The Panzer IV lg.(V) was a PzKpfw IV tank chassis fitted with a fixed casemate and the long 75mm gun that was fitted to the Panther tank. Aside from its role as a tank destroyer, it was increasingly used as a surrogate tank in late 1944. It had excellent frontal armor and a powerful gun. However, the excessive barrel length of its gun was a major hindrance in cross-country travel, since it could easily become involved in mishaps. Although well protected frontally, its side armor was vulnerable and the stowage of ammunition on the side walls could lead to catastrophic ammunition fires. As a result, it proved to be a formidable weapon when used as a long-range stand-off antitank weapon, but was less effective when used in close combat.

6 Steven Zaloga, *M10 Tank Destroyer vs Stug III Assault Gun: Germany 1944*, Osprey Duel 53 (2013)

The Jagdpanther combined the Panther chassis with a fixed casemate, armed with the long 88mm gun of the Tiger II heavy tank. This was an excellent long-range tank killer. It was not well suited to operations in the Ardennes, where the hilly terrain did not allow it to take best advantage of its long-range firepower. Due to a shortage of tanks, it was often misused as a surrogate tank, for example in the fighting by the s.Pz.Jäg.Abt.560 at Dom Bütgenbach against the 26th Infantry Regiment of the 1st Infantry Division during the first week of the campaign, where the battalion was decimated to little effect.

A Panzer IV lg.(V) tank destroyer abandoned on the Benelux border northwest of Bohey, on the road leading to Bastogne.

The Dynamics of Wehrmacht AFV Strength in the Ardennes, Dec 1944–Jan 1945

	Dec 16, 44	*Dec 26, 44*	*Jan 6, 45*	*Jan 16, 45*
Pzkfw IV	317	219	169	172
Panzer IV lg.(V)	171	130	97	99
Panther	341	219	173	170
Tiger	14	14	–	–
Tiger II	52	39	13	35
Sub-total Tanks	*895*	*621*	*452*	*476*
StuG III	304	281	229	264
StuH (105mm)	42	42	26	37
Hetzer	99	110	73	68
Jagdpanther	21	18	17	17
Sub-total AFV	*466*	*451*	*345*	*386*
Total Tanks & AFV	*1,361*	*1,072*	*797*	*862*

Tanks: Comparative Technical Characteristics

	M4A3	**M4A3E8**	**PzKpfw IV Ausf. J**	**Panther Ausf. G**
Crew	5	5	5	5
Dimensions: L x W x H (m)	6.27 x 2.61 x 2.74	5.89 x 2.61 x 2.74	7.02 x 2.88 x 2.68	8.86 x 3.42 x 2.98
Loaded weight (tonnes)	31.5	33.6	25.0	45.5
Main gun	75mm M3	76mm M1A1	75mm KwK40	75mm KwK 42
Main gun ammo	104	71	87	81
Engine (hp)	450	450	300	600
Max. speed (km/h)	42	42	38	46
Fuel (liters)	635	635	470	720
Range (km)	160	160	210	200
Ground pressure (kg/cm^2)	1.0	0.963	0.91	0.88
Armor*				
Mantlet (mm)	90*=>90	90@5 = 90.3	50** = >50	100** = >100
Turret front (mm)	51@30 = 58.9	51@30 = 58.9	50@5 = 50.2	100@5 = 100.4
Turret side (mm)	51@5 = 51.2	51@5 = 51.2	33@25 = 36.4	45@25 = 49.6
Upper hull front (mm)	51@45 = 72.1	51@45 = 72.1	80@8 = 80.8	80@55 = 139.4
Lower hull front (mm)	51@50 = 79.3	51@50 = 79.3	80@14 = 82.8	65@55 = 113.3
Upper hull side (mm)	38@0 = 38	38@0 = 38	30@0 = 30	50@30 = 57.7
*Armor data provided as: actual thickness in mm @ angle from vertical = effective thickness in mm				
**Curved				

Assault Guns/Tank Destroyers: Comparative Technical Characteristics				
	StuG III Ausf. G	**Pz. IV lg.(V)**	**M10 3in GMC**	**M36 90mm GMC**
Crew	4	4	5	5
Dimensions: L x W x H (m)	6.77 x 2.95 x 2.16	8.5 x 3.17 x 1.85	6.82 x 3.04 x 2.89	7.46 x 3.04 x 3.27
Loaded weight (tonnes)	23.9	25.8	29.6	28.5
Main gun	75mm StuK40	75mm KwK 42	3in M7	90mm M3
Main gun ammo	54	55	54	47
Engine (hp)	300	300	410	500
Max. speed (km/h)	40	35	45	42
Fuel (liters)	310	470	624	726
Range (km)	155	210	320	240
Ground pressure (kg/cm^2)	0.93	0.92	0.92	0.91
Armor*				
Mantlet (mm)	80@0=80	80**	57@45 = 80.6	76**
Turret front (mm)	n/a	n/a	32@5 = 32.1	32@5 = 32.1
Turret side (mm)	n/a	n/a	32@5 = 32.1	32@5 = 32.1
Upper hull front (mm)	80@10 = 81.2	80@45 = 113.1	38@55 = 46.4	38@55 = 46.4
Lower hull front (mm)	80@21 = 85.1	80@40 = 104.4	51@50 = 79.3	51@50 = 79.3
Upper hull side (mm)	30@0 = 30	40@30 = 46.2	19@38 = 30.8	19@38 = 30.8
*Armor data provided as: actual thickness in mm @ angle from vertical = effective thickness in mm				
**Curved				

US Tank Guns, 1939–45				
Caliber	**37mm**	**75mm**	**76mm**	**90mm**
Gun type	M5A1	M3	M1	M3
Tube length	L/53	L/40	L/52	L/50
Armor-piercing projectile	M51B1	M61	M62A1	M82
Type	APCBC	APCBC	APCBC	APCBC
Initial muzzle velocity (m/s)	884	617	792	814
Projectile weight (kg)	0.87	6.78	7.0	10.9
Propellant weight (kg)	0.24	0.98	1.64	3.31
Penetration (mm; @500m, 30 degree)	51	62–72	92–96	110–118
Armor-piercing projectile (HVAP)	n/a	n/a	T4 (M93)	T30E16 (M304)
Type	–	–	HVAP	HVAP
Initial muzzle velocity (m/s)	–	–	1,036	1,020
Projectile weight (kg)	–	–	4.3	6.9
Penetration (mm; @500m, 30 degree)	–	–	137	194
High-explosive projectile	M63	M48	M42A1	M71
Projectile weight (kg)	0.73	6.7	5.8	10.6
Explosive fill (g)	38	665	390	925

German Tank Guns, 1944–45			
Caliber	**75mm**	**75mm**	**88mm**
Main gun	KwK 40	KwK 42	KwK 43
Tube length	L/48	L/70	L/71
Use	PzKpfw IV, StuG III	Panther, Pz. IV lg.(V)	Tiger II, Jagdpanther
Armor-piercing projectile	Pz.Gr.39	Pz.Gr.39/42	Pz.Gr.39/43
Type	APCBC	APCBC	APCBC
Initial muzzle velocity (m/s)	790	925	1,000
Round weight (kg)	11.5	14.24	22.7
Projectile weight (kg)	6.8	6.8	10.2
Propellant weight (kg)	2.4	3.67	5.4
Penetration (mm; @500m, 30 degree)	91–96	117–129	185
High-explosive projectile	Spr.Gr.34	Spr.Gr.42	Spr.Gr.43
Projectile weight (kg)	5.74	5.74	9.4
Explosive fill (g)	653	653	861

US Army

The M4 Sherman medium tank was the predominant tank of the US Army, as well as Allied armies including the British Army. US tank units in the summer of 1944 in France were equipped primarily with the M4 and M4A1 versions. Both variants were powered by a Continental radial engine and differed only in hull construction, with the M4 having a welded upper hull and the M4A1 a cast upper hull. Nearly all of these tanks had undergone the "Quick Fix" program prior to the Normandy campaign, which included a variety of upgrades including appliqué armor over the hull ammunition and the M34A1 gun mount with the wide mantlet and telescopic sight.

By 1944, the US Army had decided to favor the M4A3 with its better Ford GAA engine. Those deployed to the ETO came primarily from the later production runs that had the later-style hull with enlarged driver's hatches. They also incorporated improved ammunition stowage, with the protected bins located mainly in the floor where they were less likely to be hit. This was called "wet" stowage, since the ammunition was encased in a thinly armored cell protected by water or anti-freeze to prevent the ignition of the ammunition by stray shards of hot metal if the tank was penetrated. This feature dramatically reduced the vulnerability of the Sherman tank to ammunition fires, the main cause of catastrophic tank loss. These M4A3 tanks first began to appear in the ETO in the late summer, often arriving with new units. They also served as replacement tanks and so could be found in many US tank units in the Ardennes, alongside the M4 and M4A1 variants.

The US Army had adopted a more powerful 76mm gun in early 1944, and the first batch of 120 M4A1s (76mm)

An M4A1 (76mm) of the 2nd Armored Division carrying infantry from 2/291st Infantry, 75th Infantry Division, near Frandeux, Belgium, on December 27, 1944, during the effort by VII Corps to close the pocket around Celles where the Panzer spearhead of 5.Panzerarmee was trapped. The 2nd Armored Division began a more systematic effort to apply foliage camouflage to their tanks in the late autumn of 1944, often over a layer of spare tracks and sandbags.

were deployed in mid-July 1944 prior to Operation *Cobra*, mainly with the 2nd and 3rd Armored Divisions. After the initial batch of M4A1s (76mm) arrived, most subsequent deliveries in the ETO were the M4A3 (76mm). The 76mm gun offered indifferent anti-armor performance when frontally facing the more thickly armored German AFVs such as the Panther, or even types such as the Pz. IV lg.(V). This was partially remedied by the development of HVAP (high-velocity armor-piercing) ammunition using a tungsten carbide core. The first rounds were rushed to France in August 1944, but they were always in short supply due to the limited availability of tungsten carbide. M4A3 (76mm) tanks during the Battle of the Bulge usually had about four HVAP rounds on hand at any time. The 76mm tanks amounted to about a quarter of US tank strength in the armored divisions in the Ardennes, as detailed in the chart below.

US Armored Divisions in the Ardennes: Sherman Tank Strength (75mm gun vs 76mm gun)

Division	Nov 1944		Dec 1944		Jan 1945	
	75mm	76mm	75mm	76mm	75mm	76mm
2nd	128	60	125	60	117	21
3rd	138	60	165	48	138	40
4th	132	18	128	17	68	16
5th	127	16	119	21	127	10
6th	157	2	122	11	139	11
7th	78	32	77	49	61	36
9th	167	0	0	168	13	95
10th	114	51	116	49	85	34
11th					98	44
Total	*1,041*	*239*	*852*	*423*	*846*	*307*

The narrow track of the Sherman tank offered insufficient flotation in mud and snow compared to the wide track on some German tanks such as the Panther. The interim solution was the attached "duck-bill" end-connectors to widen the track, and these were widely applied to US tanks prior to the Ardennes campaign. The better solution was the development of a wider 23in wide track. This was accompanied by an improved horizontal volute spring suspension (HVSS) that replaced the previous vertical volute spring

E

1: M4A3 (76mm), B COMPANY, 2nd TANK BATTALION, 9th ARMORED DIVISION, CLERVAUX, DECEMBER 1944

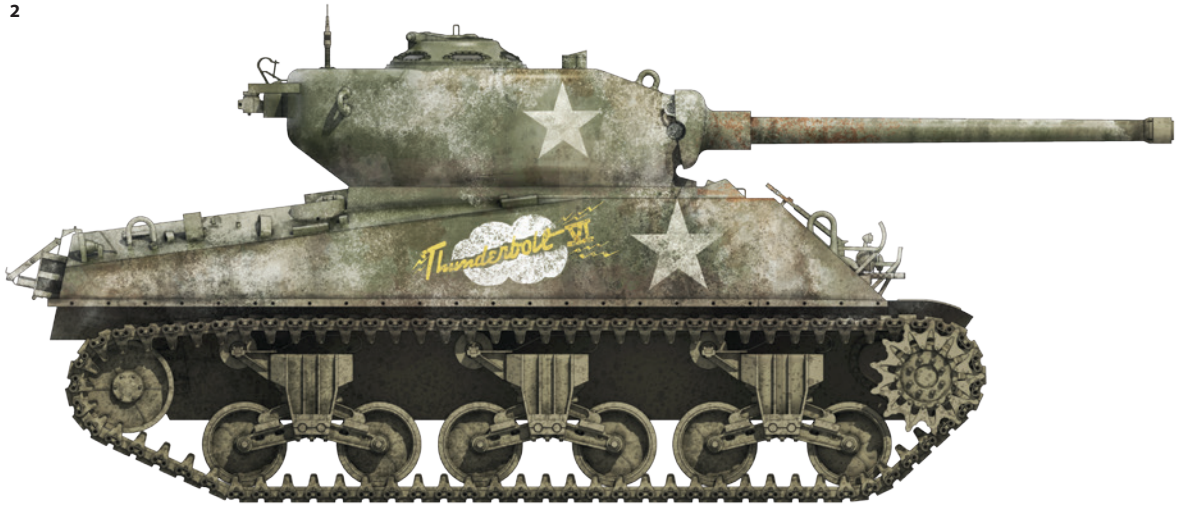
When the 9th Armored Division arrived in France in November 1944, its tanks were systematically camouflaged by the 602nd Camouflage Engineer Battalion. It was one of the few divisions to receive such elaborate treatment. This consisted of the attachment of Sommerfield matting to the side surfaces to permit the attachment of foliage. Once this was welded in place, the tanks received the usual First US Army-prescribed camouflage pattern of black over olive drab, with the white star national markings largely overpainted with olive drab or black. This particular tank took part in the fighting for Château de Clervaux, where it was knocked out on December 17. It was subsequently recovered and placed on display by the town as a memorial to the 1944 fighting. Its bumper codes were 9^2^ B-2.

2: M4A3 (76mm), HEADQUARTERS COMPANY, 37th TANK BATTALION, 4th ARMORED DIVISION, BASTOGNE, DECEMBER 1944

The commander of the 37th Tank Battalion, Lt Col. Creighton Abrams, had his tanks named "Thunderbolt," and this was his second tank in the ETO, named "Thunderbolt VII," which he was issued with in October 1944, replacing the previous "Thunderbolt VI" used in Normandy and Lorraine.

1

2



The M4A3E2 assault tank was a specialized version of the Sherman series with added hull and turret armor. It was available in very modest numbers, and this particular example is seen in Malmédy on January 13, 1945, with the 743rd Tank Destroyer Battalion while supporting the 30th Infantry Division.

suspension (VVVS). This first appeared on a version of the M4A3 (76mm), which began arriving in the Ardennes around Christmas 1944. These tanks were first called "M4A3 (76mm) with 23in track," though eventually they were dubbed unofficially M4A3 (76mm) HVSS or M4A3E8. This was the best version of the Sherman tank in service in the Ardennes.

A specialized version of the Sherman was the M4A3E2 assault tank. This resembled the M4A3 (75mm) but had a new turret and transmission cover with substantially thicker armor along with added armor plates on the glacis and hull sides. At the end of November 1944, only 140 had been issued to units in the ETO. They were the only US tanks with a reasonable chance of surviving a hit from the Panther's 75mm gun or from an 88mm gun. The lead tank of Patton's drive into Bastogne on December 26 was an M4A3E2 of C Company, 37th Tank Battalion, 4th Armored Division, commanded by Lt Charles Boggess, nicknamed "Cobra King."

One of the overlooked versions of the Sherman in service was the M4 (105mm) assault gun. This was based on the M4 chassis and later on the M4A3. These should not be confused with the M7 105mm howitzer motor carriage, which was fitted with a 105mm howitzer in an open fighting compartment. The assault guns had the 105mm howitzer fitted in a conventional turret very similar to the normal 75mm gun turret except for the mantlet. These assault guns were used to provide fire support in the tank battalions, with a platoon of three in the battalion headquarters company and one each in the medium tank companies.

Due to a shortage of readily available replacement tanks in December 1944, Bradley's 12th Army Group requested the transfer of spare British Sherman tanks from Montgomery's 21st Army Group. This eventually amounted to 351 tanks, with 254 going to units in the First US Army and 97 to Third US Army. Most of these were types already in US service, including the M4A1 (75mm) Sherman II and M4A1 (76mm) Sherman IIA. However, it also included versions not normally used by the US Army in the ETO, including some M4A2s (Sherman III) and at least 74 M4A4s (Sherman V).

The US tank units still used a large number of M5A1 light tanks. Each tank battalion had three companies of Sherman medium tanks and one of M5A1 light tanks. These were widely regarded as obsolete due to their thin armor and puny 37mm gun. Many units regarded them as needlessly under-protected and restricted their use to secondary missions. An assault gun version, the M8 75mm HMC, was also in use, mainly in cavalry units. The US Army began to replace the M5A1 in December 1944 with the M24 light tank, armed with a 75mm gun. The first two were commandeered by the tankless 740th Tank Battalion and saw their combat debut near Remouchamps on December 20.

There were three types of self-propelled tank destroyers in use in the Ardennes. The M10 3in GMC had formed the basis for most battalions since 1942 and was still in widespread service. It was adequate against older types of German tanks such as the PzKpfw IV, but could not penetrate the frontal

armor of newer types like the Panther. For doctrinal reasons, the Tank Destroyer Force wanted a vehicle with greater speed and mobility than the M10, leading to the production of the M18 76mm GMC. In the ETO, these were first issued to the tank destroyer battalions attached to some of the new armored divisions. Later, they were issued to separate tank destroyer battalions, especially those converting from towed guns. Although the M18 was much faster on the road than the M10, it offered no firepower advantage and its cramped interior was a hindrance.

A small scout party under Werner Sterneback from Kampfgruppe Peiper began probing near Büllingen in the morning of 17 December when they were ambushed by M10 3in GMCs of the 644th Tank Destroyer Battalion. This is the PzKpfw IV Ausf. J number 615 commanded by Rttf. Kasparer, one of two tanks that were knocked out in the skirmish. It was fitted with the late-style mesh "Thoma Shield" side skirts.

The most effective US tank destroyer was the M36 90mm GMC. As in the case of the M10, it was based on the Sherman chassis but with an open turret. The M36 first entered combat in the ETO in October 1944 with the First US Army during the fighting along the German border. Due to the small numbers originally available, it was not possible to equip entire battalions with the M36. As a result, the initial practice was to issue it to existing M10 battalions, usually on a scale of one company at a time. As more became available, entire battalions were re-equipped. The M36 was a significant improvement over the M10 when dealing with the Panther tank, though it was not the complete solution. The existing 90mm ammunition would not reliably penetrate the Panther glacis plate at ranges over 500 yards until the advent of improved HVAP rounds that did not begin to arrive in the ETO until January 1945. However, it was effective against the turret and the thinner side armor.

Dynamics of US Tank Strength in the Ardennes, December 1944–January 1945*

Type	Dec 16, 44	Dec 26, 44	Jan 6, 45	Jan 16, 45
M4 (75mm) medium tank	490	649	1,190	1,205
M4 (76mm) medium tank	297	237	558	511
M4 (105mm) assault gun	104	128	249	247
M5A1 light tank	501	617	1,016	945
M8 75mm HMC	60	94	137	131
Total	*1,452*	*1,725*	*3,150*	*3,039*

**Data for January 6 and 16, 1945, includes Third US Army minus its XX Corps units*

BATTLE ANALYSIS

Organizational and Doctrinal Lessons

Maj. (Dr.) P. E. Schramm, historian of the German OKW high command, concluded that "the Battle of the Bulge finally demonstrated the armored superiority of the US Army over the Wehrmacht." Schramm's comment referred to the combat capabilities of the armored units, not the technical balance.

By late 1944, the Panzer divisions had lost much of their offensive capability due to shortages of armored equipment and experienced troops. As described

The village of Krinkelt-Rocherath became a Panzer graveyard when SS-Panzer-Regiment.12 launched an attack into the defenses of the 38th Infantry, 2nd Infantry Division, on December 18. Without infantry support, the tanks were set upon by bazooka teams, hidden tanks, and antitank guns. These two Panther Ausf. Gs, numbers 327 and 154, were knocked out on the main street in Rocherath; the village water tower can be seen behind. One of these tanks was knocked out by an M4 medium tank of the 741st Tank Battalion and the other by a bazooka.

earlier, the Panzer divisions had shifted their organizational structure towards more infantry and fewer tanks better suited to defensive battles. Only one of the division's six Panzergrenadier battalions received armored half-tracks, and the remaining battalions relied on trucks, often commercial types, with poor cross-country capabilities. The divisional artillery had few self-propelled guns and relied on towed guns, which had difficulty moving forward with the Panzer regiments during offensive operations. There was a widespread shortage of artillery ammunition except during the first few days of the Ardennes offensive. There was a widespread shortage of experienced combat leaders due to the ferocious casualty rates in 1944.

By late 1944, the Panzer divisions had significant tactical problems carrying out offensive missions due to the severe weakness of the associated German infantry divisions. German tactical doctrine for a breakthrough operation such as in the Ardennes was for the infantry divisions to make the initial penetration of the enemy defense line, at which point the Panzer divisions were injected to carry out the exploitation phase. By late 1944, infantry divisions had been reconfigured in the Division-44 or Volksgrenadier configuration, which had fewer personnel and so was better suited to defensive than offensive missions. In 1944, the Wehrmacht usually assessed the divisions' combat value (*Kampfwert*) on a scale of 1 to 4, with "1" indicating fully prepared for offensive operations, "2" indicating suitable for offensive operations, "3" indicating suitable for defense, and "4" indicating adequate for defense. The infantry divisions assigned to I.SS-Panzer-Korps in the *Schwerpunkt* of the Ardennes campaign on the approaches to Elsenborn ridge were only rated at "3" in spite of the fact that the speed of the Panzer attack was largely dependent on the infantry divisions quickly penetrating the American infantry defenses. There simply were no infantry divisions rated at "1" available. The failure of the Ardennes offensive was in no small measure due to these initial infantry setbacks that led to critical delays in the introduction of the Panzer breakthrough force.

The Jagdpanthers of s.Pz.Jg.Abt.560 attached to the 12.SS-Panzer-Division took heavy losses in a desperate attempt to penetrate the defenses of the 26th Infantry, 1st Infantry Division, at the Dom Bütgenbach manor farm. This view of a farm field near the road between Bütgenbach and Büllingen shows three knocked-out Jagdpanther tank destroyers, with the village of Büllingen visible in the background. A number of these vehicles bogged down in the mud while others were hit by US artillery fire.

One sign of the atrophy in Panzer division technical development was the lack of armored engineer vehicles for rapidly breaching obstacles under fire during offensive operations. While the Allied armored divisions had dozer tanks, mine-roller tanks, and other specialized equipment, the Panzer divisions had none. This had dramatic consequences on the first days of combat in the Ardennes. The 12.SS-Panzer-Division was confronted by a row of dragon's teeth antitank obstacles all along their front line, but they lacked the means such as dozer tanks to rapidly overcome these obstacles. Instead, they had to rely on conventional engineer efforts that could not be conducted under fire. This delayed the opening of the access roads by a full day. In the 1.SS-Panzer-Division sector, KG Peiper was delayed by a downed bridge outside Losheimergraben, which caused massive traffic jams. Even after the tanks managed to skirt around the obstruction, they were further delayed after encountering an unmarked German minefield that took hours for engineers to breach by hand before KG Peiper was able to proceed. German plans had assumed that the Panzer divisions of I.SS-Panzer-Korps would be well beyond the frontier defenses by the end of December 16. Instead, the failure of the German infantry to penetrate the American defenses, combined with the inability of the Panzer divisions to rapidly penetrate the obstacle belts along the Belgian frontier, imposed costly delays that ultimately doomed the offensive.

An M4A1 medium tank of the 743rd Tank Battalion fitted with an M1 dozer blade leads a column through Malmédy on January 13, 1945, including an M4A3E2 assault tank immediately behind it. At the time, the battalion was supporting the 30th Division.

In comparison to the Panzer divisions, US armored divisions usually fought at near full strength. US armored infantry battalions and armored field artillery battalions were also fully mechanized. Ammunition and fuel supplies were ample. The US Army units also had substantial defensive advantages. The most significant US advantage was its field artillery. Artillery at divisional and corps level was fully motorized and there were ample supplies of ammunition. More importantly, the US Army had a much better fire control system than the Germans, based on extensive field telephone and radio links that provided timely and accurate targeting. US field artillery, more than any other single arm, was responsible for the decimation of the German infantry divisions in the opening phase of the offensive. Artillery also played a crucial role in the defeat of the Panzer divisions of I.SS-Panzer-Korps in the approaches to Elsenborn ridge, especially in the defeat of 12.SS-Panzer-Division.

Technical Lessons

From the perspective of the "holy trinity" of tank design – protection, firepower, and mobility – the German tanks employed in the Ardennes campaign offered excellent characteristics. However, their actual performance in the Ardennes was disappointing. This was largely due to two factors: the declining quality of German industry and the poorer training of German tank crews.

The clearest evidence of these issues occurred in the days before the start of the campaign, when the Wehrmacht initiated Operation *Abwehr*. This was the

An M4A1 (76mm) medium tank of C Company, 743rd Tank Battalion, near Ster, Belgium, on January 6, 1945. At the time, the battalion was attached to the 30th Infantry Division. The tank crew is attaching "duck bill" extended end connectors to the tracks of the tank to provide better flotation in snow and mud. The "X" prefix to the registration number indicates this is one of the Sherman tanks transferred from British stocks to the US Army in the Battle of the Bulge due to a shortage of replacement tanks. In the foreground is a disabled German SdKfz 251/9 7.5cm Stummel of 1.SS-Panzer-Division.

codename for the movement of the German Panzer divisions from their staging areas along the Rhine to the start points for the Ardennes offensive in the Eifel region on the Belgian border. The 6.Panzer-Armee commander, Sepp Dietrich, reported that about 100 of the roughly 500 tanks in the field army had broken down after the three-day road march to the start point. For example, on December 15, the 12.SS-Panzer-Division had 46 tanks and AFVs under repair out of the 115 on hand. At the outset of the Ardennes campaign, 29 percent of the Panthers were not operational. Precise details of the cause of these problems were not reported but presumably a combination of mechanical difficulties exacerbated by the poor driving skills of the novice tank drivers was to blame.

The poor reliability of German tanks was not a new problem, but it was one that became worse in the autumn of 1944. In September 1942, Hitler had ordered a new "Panzer Program" to increase production to 800 tanks per month. This had the beneficial consequence of directing more resources into Panzer manufacture, but at the same time it politicized reporting on monthly Panzer production and led to some poor industrial decisions. Albert Speer, the Reich Minister for Armaments, was under continual scrutiny by Hitler over the goals of the new Panzer production targets. Since industrial resources in Germany were finite and in great demand by other high-priority programs, Speer was obliged to cannibalize resources from other less-scrutinized sectors in order to expand the monthly Panzer production rate. For example, truck production was reduced in favor of tanks. The most insidious policy was the reduction in the manufacture of spares tank parts. Subcomponents normally set aside as spares were instead consumed to produce new Panzers. In 1943, spare parts had constituted as much as 25–30 percent of the tank contracts. By the summer of 1944, only about 15 percent of Maybach engines were put aside as spares, and by the autumn of 1944, this had been halved again to only about 8 percent. When Panzers broke down, there were no parts available for repairs.

On top of this, 1944 saw a worsening decline in workmanship in German industry, because skilled German craftsmen previously exempt from

F

1: PANZER IV LG.(V), SS-PANZERJAGER-ABTEILUNG 1, 1.SS-PANZER-DIVISION "LEIBSTANDARTE ADOLF HITLER"

The Panzer IV Langs built by Vomag in the fall of 1944 were finished in the standard three-color German camouflage, but with small patches of dark yellow to break up the dark colors. The tank destroyers of this battalion do not appear to have used any form of tactical numbering so far as is known.

2: JAGDPANTHER, 1./S.PZ.JG.ABT.560, 12.SS-PANZER-DIVISION "HITLERJUGEND", DOM BÜTGENBACH

This Heer tank destroyer battalion was attached to the "Hitlerjugend" to make up for their shortage of tanks. Their Jagdpanthers were finished in an unusual scheme of stripes of red primer over the usual dark yellow base color. Some of these vehicles also appear to have been painted with small streaks of white to make them better suited to winter conditions. The tactical number was the usual style, with the first number indicating the company and the second showing the platoon. This particular company was nearly wiped out by US field artillery during its attempts to overcome the defenses of the 1st Infantry Division at the Dom Bütgenbach manor farm.

1

2

An M36 90mm GMC of the 3rd Platoon, A Company, 628th Tank Destroyer Battalion, covering the bridge over the Ourthe River in Hotton on December 30, 1944. Although usually attached to the 5th Armored Division, this battalion was attached to infantry units in December 1944. Accounts by the 116.Panzer-Division indicate that this battalion played a crucial role in repulsing the German advance on Hotton, knocking out several Panther tanks.

An M36 90mm GMC passing through St Vith on January 23, 1945, past the wreck of a Panther Ausf. G. At this stage of the war, the M36 was still relatively uncommon, with only 236 actually deployed.

conscription were scooped up by the Wehrmacht due to the catastrophic casualty rates in 1944. In their place came foreign forced-labor from France and Western Europe and slave laborers from Eastern Europe. Not only did these workers lack the skills of the previous German workforce, but sabotage started to become an issue.

The interplay of these industrial issues led to a significant decline in the quality of the Panzers that were manufactured. The Inspector General for Panzer Troops of OB West later reported that some new replacement tanks sent to the Ardennes were cannibalized for parts to repair tanks at the front rather than being sent directly to the Panzer divisions. Of 47 Panther tanks in the Ardennes inspected by Allied intelligence after the fighting, 20 (42 percent) had been abandoned or destroyed by their crew. German prisoners of war indicated that more Panther tanks were lost due to mechanical breakdown than enemy action.

A contributory factor in technical problems in the Panzer force in the Ardennes was the slow pace of re-equipping the Panzer divisions with equipment after the summer campaigns and, as a result, a shortage of time to train new crews. The divisions did not receive their new Panthers until mid-October or November and tank crew training was often limited to two weeks, even in the elite Waffen-SS units. The training was compromised by an almost total lack of fuel and ammunition. Gunnery training consisted of dry runs, with occasional use of co-axial machine guns. A lack of fuel prevented exercises above platoon level. During the Ardennes fighting, the Heer Panzer crews of the 5.Panzer-Armee were generally better trained than the Waffen-SS crews, simply because these divisions had remained in combat throughout the autumn fighting.

For the US Army, the Ardennes campaign revealed shortcomings in their tanks that had been acknowledged since the time of the Normandy campaign, but not resolved. The technical inferiority of the M4 Sherman against the Panther tank had been clear since July 1944. But consistent US battlefield victories against the Panzer force – including Operation *Cobra* in July 1944, the repulse of the Mortain Panzer offensive in August 1944, and the defeat of the Lorraine Panzer offensive in September 1944 – had led to complacency. Many US senior officers felt that the German technical advantages were offset by US advantages in quantity and reliability, as well as even more pronounced advantages in field artillery and airpower. Hitler's decision to hoard the Panzer divisions for the Ardennes offensive meant

that the scale of tank-vs-tank fighting in the autumn of 1944 was on a relatively small scale, further hiding the need for improvements. Observer teams sent to the ETO in the autumn of 1944 to solicit advice on future tank needs in 1945 did not encounter any strident demands for better tanks from armored division commanders.

On January 5, 1945, Hanson Baldwin, the influential military correspondent for the *New York Times*, published an article in a series about the Ardennes campaign entitled "New German Tanks Prove Superior to Ours – Inquiry by Congress Urged." This was the first time that any public attention had been focused on the issue. This controversy would percolate on through March 1945, with Eisenhower soliciting the opinions of his subordinate commanders. In fact, the Battle of the Bulge had made this issue irrelevant. No matter how many technical advantages the Panther enjoyed over the Sherman in early 1945, it was of little consequence when there were only 96 Panthers operational on the entire Western Front on February 5, and just 24 operational on April 10, facing more than 6,000 US Army Sherman tanks.

Tiger II number 332 of 3./s.SS-Pz.Abt.501 was moved from La Gleize to Spa for a display near the First US Army headquarters. Here, it was photographed next to a whitewashed M4A3 (76mm) medium tank to provide a size comparison. Both tanks were of similar height, but the Tiger II was significantly wider.

The lessons of the Ardennes fighting led Bradley's 12th Army Group to recommend the suspension of the shipment of any further 75mm M4 Sherman tanks to the ETO in favor of the 76mm tanks, and especially the new M4A3E8 (76mm). There was also greater pressure to field the new T26E3 Pershing heavy tank, and to increase supplies of HVAP ammunition for both tanks and tank destroyers. Local initiatives were undertaken by ordnance units in the ETO in February 1945 to improve the protection of tanks using improvised armor including sandbags and extra armor plate, though this practice remained controversial.[7]

A thoroughly demolished Jagdpanzer 38 photographed near Hosingen after the Ardennes fighting. The extreme damage was probably due to an internal ammunition explosion. The 26.Volksgrenadier-Division was active in this sector, so this vehicle possibly belonged to its Sturmgeschütz Abt.1026, which received 14 of these in October 1944.

Tank Casualties

Details of tank casualties during the Battle of the Bulge are available for the US Army but very spotty for the German forces. German reports on tank strength from various headquarters, including OB West and the Inspector General of the Panzer Troops, through November 1944 have survived in the archives, but data after November 1944 is much scarcer and less complete.

German Panzer strength reports usually consisted of three categories: Authorized (*Soll*); On hand (*Ist*), and Operational (*Einsatzbereit*). Some documents list total loss (*Totalausfall*) for a given period, but this included only those AFVs completely written-off such as those left behind on the battlefield. The main problem stems from the

7 Steven Zaloga, *Panzerfaust vs Sherman: European Theater 1944–45*, Osprey Duel 99 (2019)

A PzKpfw IV Ausf. J, Panzer 332, of platoon leader Lt Stenzel from 3./ I./Pz.Regt.33, 9.Panzer-Division, knocked out on January 14.

difference between the categories of "On hand" and "Operational." In this book, this undefined fraction is listed as "disabled." Some of these AFVs may have been in short-term repair, but most appear to have been combat casualties that were recovered though not necessarily repairable. From strength reports later in 1945, there is little evidence that these tanks were repaired and put back into service use. More likely, they were either written-off at a later date or sent back to Germany for scrapping or complete rebuilding.

Records for some discrete categories can be tracked in more detail, for example the status of the PzKpfw IV and Panther tanks in the eight Panzer divisions fighting in the Ardennes. Records of other units such as the numerous assault gun companies in the infantry divisions are far more difficult to tabulate.

There were 259 PzKpfw IVs in the eight Ardennes Panzer divisions, plus 26 replacement tanks received after the start of the campaign. On January 15, 1945, there were 139 on hand, of which 77 were operational, indicating a total loss of 136 tanks (48 percent) and a grand total of 198 lost or disabled, representing 72 percent of the starting strength. In the case of the Panther, there were 429 at the start of the offensive, plus 37 replacements after the start, for a total of 466 tanks. At the end of the campaign there were 249 on hand, of which 102 were operational, with 185 total losses (40 percent), indicating total casualties of 354 lost or disabled, or 78 percent of the starting strength. Even here, there are some discrepancies in numbers since some reports seem to include the Beobachtungspanzer IV artillery observer tanks and Panther command tanks (Befehlspanzer), while others do not; these were small in number, typically under ten per division. The Wehrmacht probably suffered total losses of about 610 tanks and AFVs in the Ardennes fighting, with a further 770 disabled, for a total of 1,385 lost and disabled.

US tank losses in the Ardennes were numerically greater than German losses simply because the US Army had so many more tanks and AFVs in action during the campaign. First US Army had about 1,085 Shermans on hand at the end of December 1944, with about 980 operational and about 9 percent dead-lined with mechanical problems or battle damage.

The table on page 46 encompasses the US Army tanks in the Ardennes but also includes formations that did not take part such as XX Corps of

G

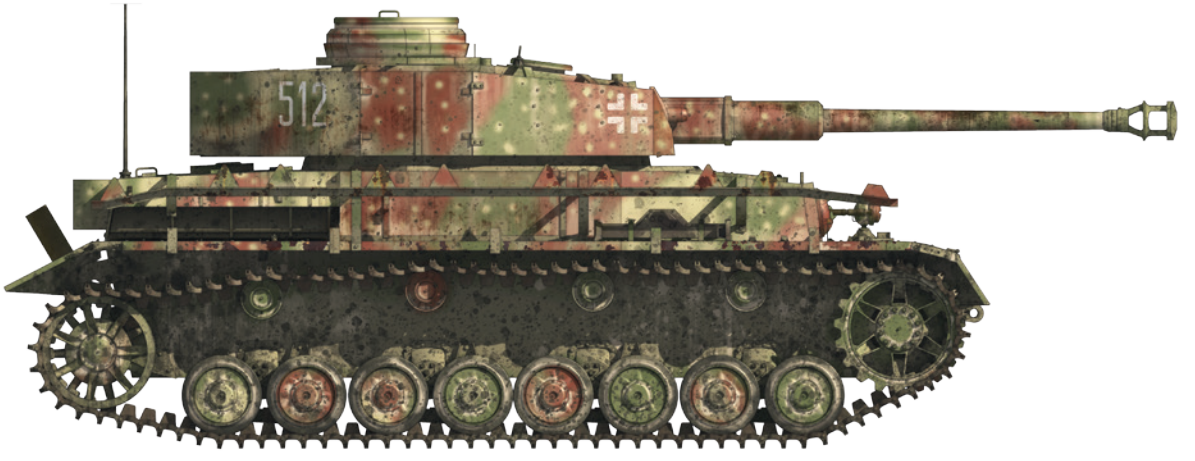
1: PZKPFW IV AUSF. J, II./PANZER-REGIMENT 16, 116.PANZER-DIVISION

The II.Abteilung, Panzer-Regiment 16, was equipped with the PzKpfw IV while the I.Abteilung received the Panther tank. This battalion used typical tactical numbers, with the first digit indicating the company, the second the platoon, and the third the individual tank. This tank received the standardized factory scheme from the fall 1944 production which had small dots of dark yellow over the dark camouflage colors, sometimes called "ambush" camouflage. This particular tank was knocked out during the fighting for Hotton.

2: PZKPFW IV AUSF. J, 3./ I./PANZER-REGIMENT 33, 9.PANZER-DIVISION

This was the PzKpfw IV Ausf. J Panzer, tactical number 332, of platoon leader Lt Stenzel from 3.Kompanie, I.Abteilung, Panzer-Regiment 33, knocked out on January 14 in the fighting outside Bastogne. It was finished in the usual factory-applied three-color camouflage. This regiment was named after Prinz Eugen and so carried the insignia of a knight on a charging horse, visible immediately in front of the tactical number on the turret skirt.

1



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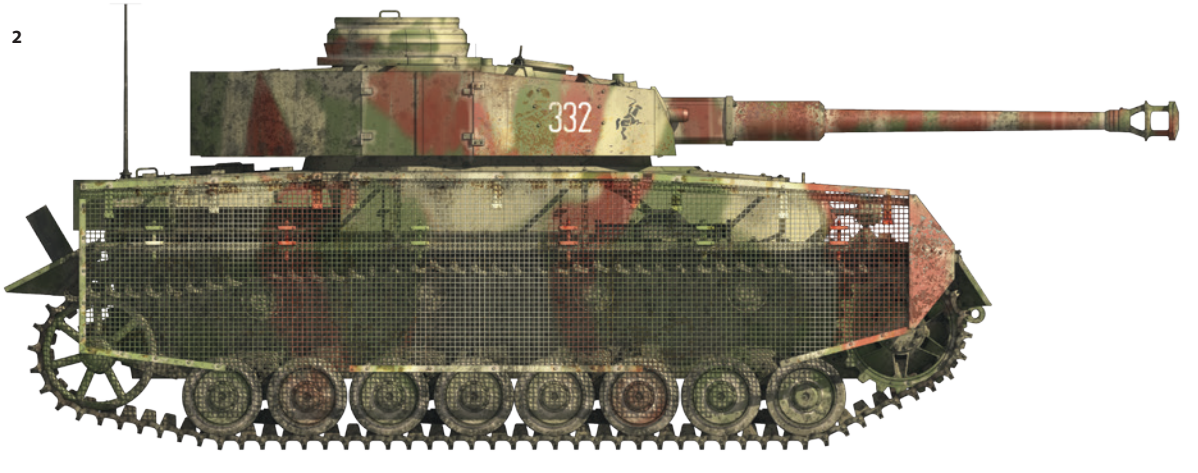

the Third US Army, as well as elements of the Third US Army that did not arrive in the Ardennes until well after Christmas. So the overall totals are higher than if it was possible to isolate only those tanks lost in combat in the Ardennes.

US Army Tank Losses

Type	Army	Dec 13–20	Dec 21–28	Dec 29–Jan 5	Jan 6–12	Jan 13–19	Total
M5A1	First US Army	7	65	4	4	28	**108**
M5A1	Third US Army	–	8	13	16	0	**37**
M4 (75mm)	First US Army	35	165	31	13	55	**299**
M4 (75mm)	Third US Army	–	3	42	28	0	**73**
M4 (76mm)	First US Army	41	40	12	0	20	**113**
M4 (76mm)	Third US Army	–	29	89	32	8	**158**
M4 (105mm)	First US Army	1	19	0	0	0	**20**
M4 (105mm)	Third US Army	–	1	2	0	0	**3**
Sub-total Light		*7*	*73*	*17*	*20*	*28*	*145*
Sub-total Medium		*77*	*257*	*176*	*73*	*83*	*666*
Total		**84**	**330**	**193**	**93**	**111**	**811**

Losses for the US tank destroyers are not as well detailed as for tanks. Available figures contained in the chart below cover all tank destroyer losses in the ETO, and so are not limited to the units participating in the Ardennes campaign.

US Army ETO Tank Destroyer Losses, December 1944–January 1945

	Dec	Jan	Total
M18	44	27	71
M10	62	69	131
M36	21	26	47
Total	**127**	**122**	**249**

This Panther Ausf. G, turret number 111, originally served in I./Pz.Regt.24 and transferred to I./Pz.Regt.16 of the 116.Panzer Division. While crossing the Ourthe river bridge near Houfallize, it fell into the river due to the detonation of an aircraft bomb nearby. It was pulled out of the Ourthe in September 1947, and eventually placed as a war memorial in the town at the junction of Rue de Bastogne and Rue Saint-Roch. This photo was taken by the author in 2001, but the tank was removed for restoration in 2018. (Author)

The source of tank casualties in the Ardennes was never recorded. A post-war study of overall US tank losses in the ETO in 1944–45 assessed the source of tank losses to be gunfire (49 percent), mines (17 percent), antitank rockets (11.5 percent), other weapons (4.5 percent), and non-combat losses (18 percent). Most studies were unable to distinguish the source of gunfire casualties, so it is unclear what fraction of tanks were knocked out by German AFVs versus towed antitank guns. A German assessment of kill claims by gunfire for the early summer of 1944 suggests that 53 percent were claimed by tanks, 14 percent by assault guns and tank destroyers, and 33 percent by towed antitank guns and other artillery. The breakdown in the Ardennes was probably different due to the lower percentage of tanks as a fraction of German AFV strength there compared to Normandy. A rough estimate suggests that US tank losses to gunfire in the Ardennes was probably in the order of 65 percent to German tanks and AFVs and

35 percent to towed antitank guns and other artillery. No comparable assessment of the cause of German tank and AFV losses is known to have been tallied.

The Ardennes campaign dealt a death blow to the Panzer force in the West. In mid-January, the 6.Panzer-Armee was transferred from the Ardennes to Hungary to deal with the Red Army's winter offensives. On February 5, 1945, OB West had only 190 tanks, 533 assault guns, and 87 tank destroyers operational on the entire Western Front, due to the catastrophic losses suffered in the winter campaigns in the Ardennes and Alsace. On April 4, 1945, the total had been reduced to only 47 tanks, 183 assault guns, and 39 tank destroyers. Facing them were 5,180 US Sherman tanks and 3,425 British tanks in late January 1945, and 6,340 US Sherman tanks and 4,240 British tanks in late April 1945, plus thousands of other types of AFVs. The Ardennes was the death ride of the Panzerwaffe in the West.

This M4A3 medium tank was first displayed on Place McAuliffe in Bastogne in 1948, but without a turret. It was "Barracuda" of the 41st Tank Battalion, 11th Armored Division, commanded by SSgt Wallace Alexander and knocked out between Hubermont and Renaumont on December 30, 1944. A turret from another tank was later installed. It is shown here in 2001 in 4th Armored Division markings. (Author)

FURTHER READING

The Battle of the Bulge is amply covered in a wide range of published accounts, many of which are listed in the bibliographies of other Osprey books.[8] The aim of this book was to provide a concise primer focused on armored warfare in the Ardennes. To offer a fresh perspective on this issue, this book contains a great deal of new statistical data and organizational information on armored warfare in the Battle of the Bulge.

The German data presented here came primarily from archival sources. Charles V. von Luettichau's study "Armor in the Ardennes Offensive: A Comparative Study of the Potential, Authorized and On-Hand Strength of Panzer Units in the West, November 1944–February 1945" (US Army Chief of Military History, June 1952) provides a broad overview of the surviving German records on Panzer strength in the Ardennes. A second source is the US Army's Ardennes Campaign Database compiled from archival records by Trevor Depuy's Data Memory Systems, Inc (DMSI) for the US Army Concepts Analysis Agency for their Ardennes Campaign Simulation (ARCAS). This was amplified with data from the records of OB West and Generalinspekteur der Panzertruppe found in the Record Group 242 microfilm collection at the National Archives and Records Administration (NARA II) in College Park, Maryland.

Data on US tank strength and losses was compiled from numerous records of AFV&W Sections of various US Army headquarters associated with the 12th Army Group, located in Record Group 407 at the US National Archives and Records Administration in College Park, Maryland.

One of the best-known Tiger II tanks is number 213 from 2./s.SS-Pz.Abt.501, preserved at the memorial museum in La Gleize. Commanded by Ostuf. Helmut Dollinger, it reached La Gleize with Kampfgruppe Peiper on December 18. It was knocked out by US tank gun fire near the Wérimont farm on December 23, 1944, during an encounter with the 3rd Armored Division. (Author)

8 Steven Zaloga, *Battle of the Bulge*, Osprey (2010)

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Glossary

AFV	Armored Fighting Vehicle
APCBC	Armor-Piercing Capped Ballistic Cap
Heer	Army
Heeresgruppe	Army Group
HVAP	High-velocity, armor piercing (projectile)
KStN	Kriegsstärkenachweisungen: War establishment strength
OB West	Oberbefehlshaber West: High Command West (Rundstedt's HQ)
Panzerjäger	Tank destroyer
s.Pz.Abt.	schwere Panzer Abteilung: Heavy tank battalion
s.Pz.Jg.Abt.	schwere Panzerjäger Abteilung: Heavy tank destroyer battalion
Sturmgeschütz	Assault gun
Wehrmacht	(German) armed forces